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TABLE OF CONTENTS

PANEL I

GENERAL SEMANTICS

GENERAL SEMANTICS AND FOREIGN LANGUAGE TEACHING

VAL HEMPEL
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The purpose of this paper is an attempt to suggest that a considerable portion of the methodological divergence found in foreign language teaching has its foundation in the fact that some language teachers, as many others, are basically unaware of what constitutes total linguistic reality and consequently fail to consider important aspects of the complex event which we call the human communication process.

Among General Semanticists it is a basic concept that language symbolizes experience and that through language we structure our perception of the world which surrounds us. The Whorfian-Sapir-Korzybski hypothesis states that changes in language habits can transform our appreciation of the universe. In other words, the perception of reality may be manipulated linguistically. Thus, a century-old building will, to one person, be nothing more than a drafty and creaky box, while another sees a priceless, artistic and architectural monument. But regardless of the symbolic labels we attach to it, the building remains the same physical reality. The communicative manifestations which we call language are also realities, no less real than the building. To be sure, the manifest complexity and the elusive and fleeting qualities of the vocal communication process are infinitely more difficult to examine than most physical objects. However, what we say about language is, nevertheless, a symbolic abstraction of the characteristics which we perceive when we study acts of speech or writing. Our perception, and consequently our understanding of language, depends upon what specific characteristics we have abstracted from the linguistic reality. It must also be remembered that the very moment we have constructed a verbal map of the complicated set of events we call language, we have also conditioned our perception so that we tend to be aware only of those characteristics which we have included in our verbal map. Symbolic structures not only condition our world outlook, they also perpetrate it. In other words, once we have analyzed language and arrived at a statement about its nature, we tend to pattern the results of subsequent investigations upon the image of the original statement.

The results of this process can be seen particularly clearly when we consider from an historical point of view how Western culture has conceptualized the linguistic event. The astonishing Greeks of the classical period developed the study of language as an integral part of their system of philosophy. However, their reluctance to engage in extensional observation often blocked insight. It was not until the 3rd century, B. C., that circumstances not connected with philosophic speculations led the Greeks to direct their full attention to observable linguistic occurrences. They gradually began to notice that the contemporary *written language* was in the process of diverging and changing from the language used in the Homeric literature. Subsequent efforts, prompted by reverence for what they believed to be the perfect linguistic form, sought to halt this development and to stabilize and preserve the linguistic heritage. However, this effort forced the literary critic and the literary scholar to engage in an extensional examination of the written language. In the second century B. C., the Alexandrian, Dionysius Thrax, wrote the first genuine grammar of the Western World. In his book, Dionysius divided the Greek language into categories, or parts of speech. He also developed and classified most of the standard grammatical terminology which we employ today. This excellent work of pragmatic grammatical description has often been called one of the most influential books ever written. When it is considered that most of our grammar books continue to use the terminology of the Alexandrian school, and that we frequently teach Finnish or English patterned after the Greek grammatical classifications, we must agree that this scholastic feat of more than 2,000 years ago indeed had far-reaching consequences.

At this point it is well to keep in mind that the Greeks examined the written classical language—itself an abstraction and a symbolization of the spoken language—and extracted from it a number of characteristics which formed their grammatical concepts. In other words, they sliced the Greek linguistic pie in accordance with the aspects they had perceived. This partial map of linguistic reality made it difficult for other philological voyagers who wished to explore the realm of language to perceive the territorial features which the map did not depict.

With the decline of Greek scholarship and the ascendancy of the Romans, Greek linguistic tradition was transferred to Rome. Latin grammarians followed closely in the Greek footsteps by translating the names for the word-classes and by adopting the general system

of Alexandrian classification. To be sure, they rendered the descriptive system far more complete, but they did not add any fundamentally new concepts. By the same token, subsequent Western European linguistic investigation did not discover new territories.

Medieval grammatical scholarship consisted mainly in redrawing and copying former maps. Much of what was added was, in fact, "mermaids," "billowing clouds over the oceans," and "spurting whales in the seas." Medieval grammarians who looked upon their Latin predecessors as infallible founts of logic and truth were content to retrace the ground of their classical colleagues and take their word for what constituted linguistic reality.

The classical tradition was, in fact, so powerful that the vernacular languages of Western Europe were not even considered worthy of serious study. When the grammarians during the Renaissance finally began to turn their attention to languages other than Latin and Greek, they applied the classificatory systems which had been developed from written Greek and Latin, but which were not necessarily practical or realistic for other languages belonging to a different linguistic type. To what extent Hellenic grammatical classification has affected later linguistic thinking can be understood when, for example, one considers that it is only during the last decade that English has been fully analyzed in terms of its own structure. Heretofore, English grammar rested uncomfortably in the Procrustean bed of the classical grammatical tradition.

Many of today's language teachers are far more at home in the conventional prescriptive grammar than in modern descriptive analysis. The consequences of the original Greek map are still strong. Thinking about language and grammatical conceptualization is to a significant degree still influenced by that map. For example, when so many find the results and principles of the modern linguistic science so uncomfortably difficult to digest, it is often because they look upon language through the polarized glasses of the ancient Greek system of classification and its traditional terminology.

The dawn of the modern linguistic science did not come until the beginning of the nineteenth century, and it came as a direct result of the rediscovery of Sanskrit, the language of Panini. Two, or perhaps three, centuries before the Greek attempts at grammatical analysis and description, the Hindu grammarians shifted their interest from the ancient, sacred, religious texts and hymns to Sanskrit, the language of the upper classes. Just as the Greeks were prompted to examine the

written language because of discrepancies between contemporary written forms and the Homeric literature, so the Hindus noted with alarm that spoken Sanskrit was being contaminated by the vernacular of the lower classes. Conservative consternation at seeing the linguistic status symbol threatened caused scholars to engage in a systematic and thorough-going extensional description of the revered Sanskrit in order that they in this manner would have a tool with which to preserve it, free from the embarrassing influence of the lower classes. However, the important difference between the Greeks and the Hindus is that the former concerned themselves with an investigation of the written language, while the Sanskrit scholars analyzed the spoken language in minute detail. They were thus much closer to the linguistic event. The descriptive work of the Hindus culminated in Panini's grammar which remains today a monument to linguistic scholarship not surpassed. Panini's work is an accurate and finely drawn map of the territory of spoken Sanskrit.

The rediscovery of Sanskrit forced nineteenth century philologists to consider not only the written language, but also to investigate the spoken language and thereby consider its phonological structure. This step immediately opened a new and vast, unexplored territory, and it was the catalyst which made possible the exciting and explosive growth of Western-European linguistic scholarship. The fertile school of comparative philology had come into being. The basic limitation of nineteenth century linguistic research was, however, that it to a significant degree restricted itself to the languages which belonged to the Indo-European family. The new map was immensely improved, and it included important characteristics of linguistic reality which earlier had been overlooked. But there were better maps to come.

Once more it was not entirely a deliberate attempt to penetrate deeper into language which yielded new awareness; it was new circumstances which further parted the curtain around reality.

American anthropoligists began shortly after the turn of the century to take steps to describe the vanishing Amerindian languages in order to preserve them for posterity. This work yielded new insight into the minimum segments which constitute the significant units which compose the hierarchy of the verbal communication system. Men like Sapir and Bloomfield became the founders of the modern school of American analytical and descriptive linguistics.

The happy territorial conquests of the modern linguistic scientist can, of course, not be accepted as the ultimate in language research.

We must keep in mind the semantic precept that all the characteristics of the territory can never be included in the map. We know much about language, but we still do not know all that there is to know.

In view of the above brief and very incomplete analysis of linguistic development, I believe it is a reasonable assumption that much of the disagreement which exists among language teachers today stems from the fact that they do not employ the same maps to guide them in their attitude toward language or in their teaching efforts. A language teacher who perceives language in terms of a map which basically was drawn up by Dionysius Thrax must necessarily come to some very different conclusions about his aims and methods than the teacher who views language in terms of a map composed by the modern structural linguist. The problem of improving language teaching is, however, not entirely limited to a "map revision" of what constitutes the elements of speech and writing. Some language teachers, despite "out-of-date maps" and erroneous attitudes toward language, achieve good results. A great many native speakers teach their vernacular to foreigners with obvious success, notwithstanding the fact that they by-passed Teachers' College on their way to the podium. Charles A. Hockett said recently that "Were we forced—as I sincerely hope we are not—to choose between the 'instinctively' expert teacher and the teacher who relied wholly and coldly on the careful codification of the results of the linguistic analysis, the former should win hands down."

We cannot be satisfied with relegating language teaching to "instinctive" or "unconscious" behavior on the part of the teacher. The problem appears to transcend purely analytical linguistic awareness, and the science of language has often restricted itself to the corpus of the speech signals.

The field of General Semantics, on the other hand, investigates the purpose of man's capacity for symbolic behavior and includes the symbol-making machinery in its area of direct observation. It concerns itself with the matrix of neuro-muscular processes of semantic interaction, i.e., with the effect of the environmental stimuli on the human mechanism and vice versa. The study of General Semantics is therefore capable of shedding additional light upon the communi-

cation event. Its "map" of linguistic reality charts additional characteristics and thus renders our total perception and awareness of language more complete.

The "instinctively expert teacher" of foreign languages is the person who unconsciously exposes the learner to the total range of implicit and explicit communication signals. In so doing he may indeed get results, but he achieves them to the detriment of economy. He is like the nature doctor who has come into possession of a great number of "wonder drugs" without knowing anything about their specific individual antibacterial properties. In curing his patient of an infection he gives him the full range of medication, despite the fact that only one kind would have sufficed.

The most effective teacher, on the other hand, is the one who not only is aware of the contrastive phonemic, morphemic and syntactic relationship between the target language and that of the student's, but who in addition realizes the immense importance of the non-linguistic aspects of language which include facial expression, gestures, and voice color.

An important function of language recognized by the general semanticists is that speech behavior reflects the internal condition of the person talking. The acoustic qualities of voices affect us as being either gay or sorrowful, angry or friendly, surprised or placid. Not only does the voice carry phatic information about the speaker, but gestures and facial expressions also carry significant aspects of meaning. The quality of the voice, plays an important role in language learning. I am not alone referring to the supra-segmental phonemes of stress, pitch, and terminals, but also to voice coloration.

From observation it appears that the first quality of speech that babies seem to perceive and react to is the tone in which something is uttered. Even very young babies demonstrate by expression and reaction that they clearly distinguish between that which is said tenderly and lovingly, as against, for example, something spoken crossly or in anger. This obvious awareness of differences in tonal quality is also apparent in the later stages of language development particularly when the baby begins to babble. Thus, it is possible that the young child develops an awareness of tonal voice characteristics some time before it gains any understanding of segmental groupings. By the same token, children seem to develop the ability to form correct intonation patterns prior to being able to use even a limited range of the articulated speech sounds in utterances. These facts

may indicate that the aspects of tonal quality may be basic to speech and that their mastery form the foundation for subsequent normal linguistic growth.

Voice coloration obviously must be considered one of the important aspects of language and therefore should be conscientiously taught in a foreign language course—and not just when stress and intonation have phonemic function. Despite this fact, hardly one in a hundred of the foreign language texts available today contains any attempt to present even rudimentary stress and intonation material. Inseparable from the stress and intonation patterns of a language are the underlying non-linguistic factors which are easily overlooked, but without which the language cannot be learned completely and with native fluency. Speech is an integrated function of complex neuro-muscular activities which are not restricted to those which are directly responsible for phonation. Every stress peak is accompanied by specific muscular contractions which are overtly observable, for example, by movement of the head or the hands. Emotion results in more pronounced muscular contraction and consequently in more specific patterns of movement. By the same token, gestures and facial expressions accompany the falling and rising intonation patterns of our speech. Each language employs its own system of structural muscular movements which is completely correlated with the linguistic structural composition of the utterances. If one were to observe a silent film which showed two persons engaged in animated conversation, it would not be unreasonable to assume that it would be possible to determine something about the language employed without resorting to lip-reading. There are, of course, very fundamental differences in the muscular activity involved when a Frenchman speaks French as against an Englishman who is speaking English. Unfortunately, this aspect of speech is nearly completely neglected in connection with foreign language teaching, but it should be realized that a student will never really learn to *sound* like a native until he has learned to *act* like one.

General Semantics deal with language in its broadest and most inclusive aspects, particularly its effects and its purpose. The hierarchy of linguistic segments is the tools of language. Language teachers should not only give their students the tools of language—they must also deal with the purpose of language. Hayakawa says, "Informative uses of language are intimately fused with older and deeper functions of language, so that only a small proportion of utterances in everyday life can be described as purely informative."

The informative aspect of language occupies a much smaller portion of our total utterances than we normally realize. Our academic heritage of mass literacy and the resulting dependence upon the written word often makes us impervious to a realistic awareness of the spoken language. Consequently, when we are confronted with the task of teaching a language, we tend to select as linguistic models for our students examples which basically reflect written form. Even when we are firm believers in the audio-lingual method, we often do not teach the spoken language but rather a verbal reflection of the written forms. And most frequently, the selected samples represent the pure cognitive function of language. A very substantial portion of the utterances we employ in normal everyday situations are not informative in character, but is what Hayakawa calls "presymbolic:" that is, they do not necessarily convey factual information about conditions in the physical world—rather, their main purpose is to express our feelings, emotions, and judgments. Nearly everything we call "small talk" is presymbolic in nature. The function of presymbolic language is to establish rapport between the speaker and his correspondents. Consequently, it does not matter what specifically is said within the established framework of social conventions, but rather that something is said in the first place.

Every language has a surprisingly rich stock of *utterance units* which are used regularly when its speakers engage in social, cooperation-developing, non-informative conversation. These ready-made recurrent "bound" expression units—phrases, colloquialisms and clichés—have an extremely important function. They permit the speaker to enter into contact with his fellow man and to engage in a natural conversation. For the language student it means that the ability to use non-informative language permits him to begin a conversation, to enter into contact freely without engaging in "oral compositions." It also gives the learner a feeling of linguistic control which helps establish self-confidence.

An examination of available language texts discloses that very little of the language used falls under the noncognitive category which I have discussed above. The majority of the texts use purely informative language, usually dealing with descriptive selections on the geography, history and general-interest aspects of the target language area.

Only very few contain material which reflects high frequency conversational structures couched in semantically realistic situations.

It is, of course, obvious that this paper has only dealt with isolated areas in which General Semantics can be a helpful aid to the foreign language teacher. In the final analysis, the most significant contribution which the study and understanding of General Semantic principles promises the language teacher is a more realistic orientation to what language is, how it affects us, and above all a realization that the linguistic signal (acoustic or graphic) is only a segment of the total symbolic structure which constitutes human communication.

SOME SEMANTIC GOALS FOR APHASIA THERAPY

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The aphasia therapy session is a unique laboratory for language study. When an adult suffers brain damage, words and the things they represent—symbols and things symbolized—get separated, jumbled, and confused. Some of the comments which aphasics make about their own condition are revealing:

"There is something I know and want to talk about, but it's all whirling inside and I can't pin it down."

"I know now what's the matter. I don't know meanings for words."

"I know this word, *both*—both arms, both legs. But *both*, no meaning. Why? Why?"

"I don't know what *I* means."

"I talk, really fine. But think, no, terribly hard. I wake up, four o'clock, five o'clock. What to do? I can't think. I, really wild!"

Here in the disrupted language of aphasics, the thought processes which underly all symbolic behavior are laid bare for examination. It is the task of the aphasia therapist to get the symbolic process going again. This means not merely teaching vocabulary, but often helping to reestablish the kind of ideation which the vocabulary and grammar presuppose. One cannot speak a language until he can think the thoughts which that language represents. Symbolism is difficult for the aphasic because he has lost the nonverbal abstractions which words symbolize. He is reduced in what Goldstein[1] calls "abstract attitude." It is these abstractions that the therapist must help to recreate.

A person with a General Semantics background cannot help but see this as General Semantics training in *reverse*. Korzybski[2] was concerned with our overemphasis upon abstractions and our unaware-

[1] Goldstein, Kurt, *Language and Language Disturbances*. N. Y.: Grune and Stratton, 1948.

[2] Korzybski, Alfred, *Science and Sanity*. Lakeville, Conn.: The International Non-Aristotelian Library Publishing Co., 4th ed., 1958.

ness of the highly abstract level of most of our daily talking. He deplored our confusion of abstract with concrete, our propensity for believing that the abstractions we make with words represent the world of observable reality. Our communication failures, our frustrations and stupidities stem from this foolish belief in the concreteness of our own abstractions. General Semantics was an attempt to expose and systematize the ways in which language leads us away from reality by its oversimplification and distortion of the nonverbal things it symbolizes.

Clearly, Korzybski was *not* talking about aphasics. With brain-damaged people the problem is not overabstraction but underabstraction. Yet the very fact that Korzybski's formulations fit the disturbed language condition of the aphasic—even if they do it in reverse—lends support, I think, to the insights he had into language and its influence upon the mental life of the language-user. As has been indicated elsewhere [3], every principle of General Semantics is usable to an aphasia therapist, not as evaluational *errors* to be avoided, but as actual *goals* to be achieved during the course of therapy.

1. *Establishing categories for words to represent* is one of the first goals in language training. Categories are basic to any language, any thinking, any structured organization of experience. Yet it was just this kind of categorical thinking that Korzybski warned against —our tendency to lump things together by our verbal classifications, neglecting to see their differences. Words actually blind us to the endless variation between things in a verbal category. Because things are named by the same word, we tend to evaluate them as identical and to behave accordingly. To break up this stereotyped, overgeneralized kind of thinking, Korzybski suggested, for example, that we should not think of *chair*, but of *chair* $_1$, *chair* $_2$, etc. The index was to be a reminder that the verbal classification was an abstraction, not a true representation of observable reality.

A severely aphasic person, however, sees such individuality and uniqueness in the world about him that even using the same word to name different objects may be beyond his abilities. Things don't look alike to him; they look different, completely different. He gropes to find the common element between things which a word symbolizes. Abstracting similarities must be done by conscious effort.

One of my cases, reduced to this extremely low level, painstak-

[3] Lee, Laura L., Two Kinds of Disturbed Communication. *General Semantics Bulletin*, Nos. 22 and 23 (1958), 47.

ingly learned to name a few familiar objects when I pointed to them —*chair, table, lamp, pencil.* But when I said, "Now you find another chair," he looked about the room, looked at the ceiling, the windows, the walls, as though hoping that one would come into his field of vision. He even looked at other chairs, but failed to identify them. He sees *chair* $_1$ and *chair* $_2$, but not *chair.* He lacks the mental image, the abstract category, which the word *chair* represents. Since English categorizes objects largely by purpose, he must learn to think in terms of the usefulness of objects, the purpose for which they were manufactured and bought. That is what the word *chair* means. A chair is something to sit on, a pencil is something to write with, a lamp is something which gives light. Shape, size, color, and material are irrelevant and must be omitted from a generalized image of *table, chair, lamp.* Purpose is the abstraction which he must learn to hold in mind to the exclusion of everything else. Most of us have learned to do this so easily that we can hardly understand or empathize with the aphasic's confusion. Yet when one watches an aphasic struggle to figure out just what part of this object the name refers to, one realizes that our verbal categories are not at all obvious.

I have tried to give student clinicians a sense of this unfamiliarity with the category, which aphasics manifest, by asking them to adopt for the moment the categorizing system of some primitive language. For example, the Wintu Indians [4] categorize the following things by a single word-stem: "Mushrooms are growing," "A bird is hopping," and "I pushed a peg into the ground." To the person trained in English, this is an impossible category. But once the students are told that the word-stem abstracts the *shape* of the thing being symbolized, and that the mushroom-shape is the basis of the category, it becomes clear. A bird hopping on thin legs and a fist pushing down on a peg do resemble a mushroom-shape, if you can see it that way. Carried a step further, the students are then asked to name other things that would fit into this category and which could be named by this same Wintu word. It is interesting to watch their eyes begin to roam about the room, just like an aphasic's. They look at the ceiling, the windows, the desks, hoping that something will turn up in a mushroom-shape. People with intact nervous systems, however, can keep the abstract category in mind while scanning visually, and they can go beyond the immediate presenting situation in their search for identity, whereas many aphasics cannot. Students

[4] Lee, Dorothy D., Lineal and Nonlineal Codifications of Reality. *ETC, A Review of General Semantics,* VIII, 1 (1950), 13.

rather quickly give up looking for mushroom-shaped objects in the room and begin to search in images. They will suggest a lollipop, a stop sign, an umbrella. Nearly always their answers are nouns. Asked to find the mushroom-shape category in activities which we would codify with verbs (such as "I pushed a peg into the ground."), they are apt to be quite lost. Their rigid use of English categories makes them somewhat aphasic in Wintu.

The language learning process requires that we hold in mind the abstractions which words symbolize and then make perceptions fit into these verbal classifications. The uniqueness of things must give way to a more composite picture, a generally accepted view of the world, if we are to use words at all. Luria [5] sums it up when he says that in childhood we "develop the capacity to make specific speech structures an object of perception." It is often here that therapy with aphasics must begin.

2. A second goal of language therapy is *the combination of words into subject and predicate form.* Word order carries great meaning in English; a sentence is much more than a string of single words. This kind of symbolization by syntax is extremely hard for an aphasic to understand. Here meaning is signified not by words but by a particular arrangement of words; if you cannot give meaning to this arrangement, you cannot use the subject-predicate form. *Tom is Mary's husband* is not equivalent to *Mary is Tom's husband,* although the agrammatical aphasic is at a loss to see the difference. Their characteristic telegram style of talking is little more than a stream of individual words and catch-phrases. Word order is determined only by the sequence with which things pop into one's mind: "This dress—blue—little shop—always, always little shop—really nice things—yesterday—Mary— ten o'clock—new dress—well, why not?" The message is clear enough if the listener will supply the missing components, but there is no subject, predicate, object, etc.

It is extremely hard to teach an agrammatical aphasic to see the need for proper arrangement of words. It is almost as though he were saying (if he could), "What part of all this is the subject? How can you tell? Where do you begin?" By drill and repetition, they do get a sense of noun and verb belonging together, but often with amusing results. I asked one lady to tell me what the word *bark*

[5] Luria, A. R. and Yudovich, F. Ia., *Speech and the Development of mental Processes in the Child,* tr. and ed. by Joan Simon. London: Staples Press, 1959.

meant, and she answered, "I bark the dog." The words are not wrong, entirely, but the arrangement of words is impossible. She has no sense of actor-and-action, doer-and-deed. After we finally straightened the sentence to read "The dog barks," I asked her if she knew another meaning for *bark,* and she replied, "The tree barks." Here again, she is not wrong—she is only wrong in English. The bark of a dog must be perceived as a verb; the dog must be the actor and barking the action. The bark of the tree must be seen as a noun; the tree is the subject; the tree *has* bark. There are some languages where things are codified differently. Russian represents color by a verb: "The sky blues" and "The snow whitens." Why not "The tree barks?" Whether a particular abstraction should be codified as a noun or a verb, as a subject or predicate, is not at all obvious in the presenting situation. These perceptions are artifacts of language.

What the agrammatical aphasic has lost is the ability to perceive his world as a series of isolated actions performed by actors. His world is in flux—his word order is in flux, too. In this sense, he may be closer to reality than the rest of us. Korzybski pointed out emphatically that the subject-predicate form was a distortion of observable fact. At nonverbal, objective levels the world does not consist of actors, actions, and acted-upons. It is a fluid world, emerging, shifting, interacting. The thing-acted-upon is often just as active and dynamic a part of the scene as the actor itself; it is not merely a static recipient of action. We create the world of doers-and-deeds with our linguistic structures. As we learn language, we learn to isolate little fragments from this flow of events around us, to see them as single acts performed by actors, and to codify them by subject and predicate.

The aphasic's perceptual experience is not bound by these restrictions of the language he has lost. He no longer makes specific speech structures an object of perception. And although he may be closer to reality, in one sense, it does not make for good communication in English. As a therapist, I must help him reconstruct the subject-predicate kind of perceptual experience. Yet, as I struggle to make him see actors-and-actions, where, in truth, there are none, I cannot help but feel a little foolish at the artificial kind of evaluation I am thrusting upon him.

3. A third goal of language therapy may be to *extend the meaning of words to inferential levels.* The aphasic's proclivity for staying at the concrete incapacitates him for using words for any other

purpose than naming and reporting. One is sometimes asked. "How many words does your aphasic know?" The question is naive. One can only answer, "He knows a great many words, but he can use them only in a limited way." He understands words in one context and not in another. He is literal to a fault. He cannot accept the hypothetical or metaphorical or imaginative use of words.

To show the extremes to which this can go, I had given one aphasic lady some sentences with words omitted to complete as homework. She was to insert *yesterday, today,* or *tomorrow* to agree with the verb tense already given in each sentence. She returned it with the language task accomplished correctly; one sentence read, "Today the weather is warm." But in parenthesis she had added "(Friday, October 27)." She could not allow so general a statement to pass unqualified.

Another exercise required her to select an appropriate verb from a short list; one completed sentence was supposed to read, "I bought a dress at Marshall Field's." She left this sentence unfinished, because, she said, "I never, never Marshall Field's, dresses, no." She seemed to regard her homework as a kind of questionnaire and didn't want to give false information.

Over the months I have worked with her, an interesting thing has happened. She has learned to accept general, hypothetical, and inferential examples and sentences, but she qualifies them unfailingly with the words 'I imagine." I did not teach her this phrase; it emerged spontaneously. Nor have we ever discussed the difference between factual and inferential statements. This is something she knows almost "instinctively," and she is much keener than I in making the distinction. She spots inferences like a Geiger-counter clicking over uranium. When she says, "I imagine," I begin to look for the inference involved. Recently, in a routine question-answer exercise, I asked, "What do I put in a sugar bowl?" She answered, "Sugar, I imagine." She is right, of course—even that is an inference.

What is important here to one interested in General Semantics, is the fact that this aphasic makes fine semanic distinctions which escape most of us. Our own quickness to jump to conclusions, to think we know when we are only guessing, to infer and conclude and assume—these were evaluational errors which concerned Korzybski. Irving Lee[6] pointed out that in our language the same

[6] Lee, Irving J. and Lee, Laura L., *Handling Barriers in Communication.* N. Y.: Harper and Bros., 1957, 13.

vocabulary and grammar are used for both descriptive and inferential levels of abstraction. The declarative sentence does not specify whether the meaning it represents is factual or inferential. No wonder we mistake fiction for fact and get caught by our own false knowledge. If there were only some way to codify these subtle distinctions linguistically, some verb tense or mood or suffix to indicate "this is only a guess," would we not become more careful observers and reporters?

My aphasic lady has invented her own linguistic symbol for this purpose—she says, "I imagine" for every inference. But her overwhelming need to stick to the facts prevents her from participating in the ordinary give-and-take of everyday conversation. She is not only at a loss for words, but she cannot use the words she has to make the casual comment, the personal opinion, the quick conclusion, the offhand prediction. Since part of therapy must be to bring her to this level of verbal performance, I am constantly trying to create situations where she will need to use words inferentially. I even used a telephone call she made to me as impromptu drill material. When I said, "Hello," the voice at the other end of the line started in, "Well, now, fine, fine, yes, yes, everything fine." I was fairly sure I knew who it was, but I asked, "Who is this?" She answered, "Mrs. Lee, no?" I said, "Yes, I am Mrs. Lee. Who are you?" She was completely mystified. What inferences must one make to sense the need to identify oneself over the telephone? She never did achieve this insight. She finally answered, "Wrong number, I imagine."

4. A fourth goal of therapy—and perhaps the one which is the ultimate aim, since it is so inclusive—is to *reestablish the cultural patterns of thought* on which all language use depends. This is close to what Whorf [7] meant when he said that a language embodies the "metaphysics of the culture" or the "world-view." Dorothy Lee [8] has described it as the "philosophic basis or value system of a culture" which underlies a language. Korzybski [9] referred to the "unconscious assumptions" in language which cannot be defined by words. Goldstein [10] recognized that the language disorders of aphasics

[7] Whorf, Benjamin Lee, The Relation of Habitual Thought and Behavior to Language. In Carroll, John B. (ed.), *Language, Thought, and Reality, Selected Writings of Benjamin Lee Whorf.* N. Y.: John Wiley and Sons, 1956.

[8] Lee, Dorothy D., Being and value in a Primitive Culture. In Moustakas, Clark E. (ed.), *The Self.* N. Y.: Harper and Bros., 1956, 120.

[9] *Op. Cit.*

[10] Goldstein, Kurt, The Nature of Language. In Anschen, Ruth Nanda, *Language: An Inquiry into Its Meaning and Function.* N. Y.: Harper and Bros., 1957, 18.

reflect a different "attitude toward the world" from that held by the therapist. Language, it seems, does much more than symbolize the objective world of reality—it embodies the logic, premises, and values of the social group. The very vocabulary and grammar of a language reflect the cultural ways of looking at the world, and one must look at the world *that way* in order to use it. When language is lost or impaired, as happens in aphasia, the logic, premises, and values are no longer so obvious to the language-user.

One can hardly make lesson plans designed to "reestablish the cultural patterns of thought;" rather, it is something the therapist carries in the back of his mind throughout every lesson. One is constantly trying to get the aphasic to see, for example, linear sequential time, causality, comparative values, possible choices, predictions, motivation, and purpose, all of which have their linguistic counterparts in verb tenses, *why-because* and *either-or* constructions, words such as *what if, but, even though, in order to, rather than.* To use these words at all, one must think in certain ways; they presuppose and assume *our* cultural patterns of thought. While Korzybski urged us to free ourselves from the linguistic restrictions of these "undefinable terms," they must be deliberately taught to an aphasic.

This goal of language retraining is most evident in the conversation between aphasic and therapist which forms an important part of every session. As an example, I would like to refer to part of a tape-recorded discussion I held with one aphasic lady concerning Charles Van Doren, who had recently been in the news following the exposé of rigged TV quiz shows.

The idea for holding this discussion came to me when I read John Ciardi's [11] *Saturday Review* commentary entitled: "Exit a Symbol." The very title suggested a semantic problem in abstraction and symbolization on which I could compare my aphasic with the general public. Van Doren, said Ciardi, had became a symbol for "the intellectual life" and for "the teaching profession;" he had allowed himself to be "high-pressured into taking on this false image." Ciardi's views parallel what the General Semanticist might say about our own cultural pattern of thought which allows us to accept a symbol too readily, to confuse the abstraction with the concrete fact, and then, when the symbol is exposed for what it is, to be indignant and resentful. How quickly and unconsciously we allowed the words *Charles Van Doren* to become much more than a proper noun, to

[11] Ciardi, John, Exit a Symbol, *The Saturday Review*, Nov. 21, 1959, 27.

take on inferential meaning, and finally to symbolize qualities of particular cultural value. According to Ciardi, the real guilt rests upon "that soggy blur that passes as the mind of the intellectualoid American" and reflects the "mental flabiness of our time." What Ciardi and many of the rest of us deplore is our own patterns of thinking which allow this to happen.

Compare this, now, with the way one aphasic talked about the case. Her understanding of the factual details was fairly accurate and complete, but her comprehension of the build-up, the suspense, the motivation which prompted the deception, and the part played by public reaction to the performance was extremely poor. What was missing was her own ability to create a symbol out of Charles Van Doren, to see him as "the intellectual," "the winner," "the champion." I had thought that by emphasizing the *why-because* linguistic structure in our conversation, I could best establish the kind of thinking the subject required; therefore, our conversation abounds in *whys* and *becauses.*

Therapist: You remember about Charles Van Doren.

Aphasic: Yes.

Th.: He hasn't been in the news for a couple of weeks.

Aph.: Everything over.

Th.: Everything is finished. But you remember the story about him. Why—why did Charles Van Doren do what he did?

Aph.: This man lied.

(She does not understand the *why* form. She answers *what* happened, which is more concrete.)

Th.: Why did he lie?

Aph.: I don't know. Nobody knows. I—I—little man sometimes lie. Little men.

(She understands the *why* form, but cannot infer motivation and purpose to formulate an appropriate answer. The generalization "Little men sometimes lie" is remarkably abstract for her, but it does not answer the question.)

Th.: Because—he was a little man.

Aph.: Yes.

Th.: What did he hope? What did he want? What did he hope to get?

Aph.: Well, I imagine slightly afraid. Slightly afraid.
(Again, she does not understand the *why.*)

Th.: Afraid of the consequences.

Aph.: Yes.

Th.: Why didn't he tell the truth?

Aph.: Yes.
(Again, receptive failure on *why.*)

Th.: Because. . . .

Aph.: Well, slightly—never, never famous, but nice position and everything.

Th.: He wanted a good reputation. He wanted money.

Aph.: Yes, but I imagine—money—taxes—and this and that and this—I imagine never much money now.

Th.: Why did he agree in the first place to take the answers to these questions?

Aph.: I don't know. I always think everything honest. But I don't know.
(She understands the *why* form, but cannot reach the inferential level necessary to answer the question—nor can she make the necessary assumptions to see value in winning, having a "big name," symbolizing success. Until she does this, she cannot use the word *because.*)

Th.: Certainly he did it—because—he wanted to win.

Aph.: Yes, but why?
(This is her first appropriate expressive use of *why.*)

Th.: Why did the producers of the show—the TV men—why did they do this?

Aph.: I don't know.

Th.: Why did they tell him the answers?

Aph.: I imagine, oh, a hundred people knows—know—this things.

Th.: They wanted him to win, too.

Aph.: Yes, but why?

(Since she is now using the *why* form herself, the therapist sets out to provide her with possible answers, to recreate for her the suspense and build-up, to see if she can "get it" receptively.)

Th.: Does it make a better show, a more interesting show? Does it get more people to watch?

Aph.: I don't know, but really full house, always.

Th.: I don't mean in the house. I mean out across the country, everybody turning on that show.

Aph.: Oh, yes. I imagine thousands and thousands and thousands of people, fascinated.

(She has not seen this increase in audience as motivation for the deception. She sees it only as an additional piece of information. The therapist tries now to dramatize the suspense for her.)

Th.: Did you listen?

Aph.: Oh, always, always.

Th.: And did you watch him try to remember the answers?

Aph.: Yes. I never, never wondered. Always, always, everything honest. I don't know why. Everybody else caught on.

Th.: Isn't that funny? We were all taken in.

Aph.: Yes, yes.

Th.: But why would the producer of the show do that?

Aph.: I don't know.

Th.: He did it to increase the interest in his show.

Aph.: Yes, but why not honest—more people, more people, more people?

(She does not see that having one person win many times in succession makes for suspense and interest. The therapist again tries to create this for her.)

Th.: If it were honest, the man would have lost—maybe after two times.

Aph.: Well?

Th.: Then somebody else would be on.

Aph.: Yes.

Th.: But he kept winning, and winning, and more, and more. A hundred thousand dollars sounded so big that more people turned on their TV.

Aph.: I know. I don't know how to say it, but I know. Fifty thousand, slightly more, a hundred, less. Taxes-wise, I know.
((She is not really answering the *why* question here, but is trying to state some additional information concerning the percentage of income tax to be taken out of the prize money. She has *not* responded to the therapist's attempt to show her the motivation and purpose of winning.)

Th.: Well, anyway, we know that the producer wanted him to keep winning because—because—it increased the interest in the show. It increased his audience, his television audience all over the country. More people turned it on.

Aph.: Really?

Her last remark—"Really?"—dramatically illustrates her inability to get to the abstract, inferential level of thinking ,even when the abstractions are given to her receptively. This lady will not learn to use *why* and *because* until she can adopt the unconscious assumptions of causality, motivation, and value which these words presuppose in our language. She has lost not only vocabulary, grammar, and syntax, but a way of thinking, a world-view, a *Weltanschauung*.

It is important for the therapist to understand that these cultural patterns of thought are an integral part of the particular language itself and that they are not at all obvious, realistic, natural, or universal. The suspense, the build-up of interest, the competitive spirit, the symbol of "the young intellectual" are *not* observable parts of the presenting situation. They are attitudes we bring to it, add to it, create out of it. The words *why* and *because* assume we see things that are not there. Other languages have other sets of values, other premises, other logics. The words *why* and *because* do not even appear in some languages and would be as mystifying to these people as they are to an English-speaking aphasic.

All this the therapist must help to recreate. And whether the lesson is focused upon categorization, subject-predicate construction,

inferential thinking, or a host of other linguistic sub-goals, it is the reestablishment of these culural patterns of thought—artifical as they may be—which is the underlying goal of all language therapy.

VALUES OF A NEGATIVE METALINGUISTIC SYSTEM

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General Semantics is, basically, a negative metalinguistic system. It is built upon three negative premises. Two concern the relationships between our statements and that which the statements are about; the third is a statement about how not to speak about statements. The three premises are:

1. The map is not the territory.
2. The map is not (cannot represent) all of the territory.
3. The map must not be self-reflexive.

The terms "map" and "statements" are synonymous and will be used interchangeably throughout this paper. The term "territory" refers to that which the statement is about. In the first two premises, the territory most often refers to some non-verbal occurrence—an object, an action, a feeling, etc. Put simply, (perhaps too simply) we may rephrase the premises thusly:

1. Our statements about what we perceive are not the objects or the perceptions themselves; the word is not the thing.

2. No matter how much we may say about some object, occurrence, situation, etc., there is always more to be said: we cannot say all about anything.

3. No statement must refer to its own truth or falsity. If it does, it generates self-contradiction and/or paradox.

Alfred Korzybski's formulation of the third premise was, "The map is self-reflexive." He agreed with Royce that an 'ideal' map would contain a map of the map, and the latter a map of the map of the map, etc., and thereby involve an infinite regress. Korzybski proposed that we avoid this infinite regress by keeping in mind the multi-ordinality of the terms in our statements and thus refraining from confusing the various levels of abstraction, which confusion or identification, generates the regression.

It seems to me that this positive formulation was an unfortunate error on Korzybski's part. It has caused great confusion among stu-

dents of General Semantics. An 'ideal' map is far from ideal if it involves us in an infinite regression and a confusion of levels of abstraction; indeed, throughout his work Korzybski constantly tells us how to avoid these infinite regressions and emphasizes the great dangers involved in confusing the levels of abstraction.

By casting the third premise into the negative form, it assumes a structure similar to the first two premises and conforms much more closely to the general body of theory and practice in General Semantics. Going one step further, we might venture to say that in its positive form the map is treated as if it were a thing and thus it violates the first premise. In its negative form, we recognize the purely symbolic nature of the map and therefore realize that it can be made to take any verbal form we wish to give it.

These three negative premises reflect the hierarchal structure of our nervous system and our reliable knowledge of ourselves and the world around us. In addition, they embody the admonition that our statements about ourselves and our world should always conform to —imply—this structure. If they do not, we may be led to the formulation of theories which have a low degree of predictiveness, to the accumulation and passing on of unreliable knowledge and to distortion in the functioning of our nervous systems.

The negative structure of the basic premises and their corollaries such as the principles of non-elementalism, non-additivity, non-identity, etc., give the theory and practice of General Semantics the major part of whatever strength it may have and accounts for the truly remarkable range of coverage of the system. Indeed, this wide applicability of General Semantics theory has caused much resentment amongst non-general semanticists in that it is claimed that General Semantics is trying to "take over" every field of knowledge. It is one of the main themes of this paper that General Semantics cannot and does not try to take the place of any particular science or body of knowledge.

What, then, can it do? Essentially, it is a system for telling us how theories or sets of statements in any field should NOT be stated. It cannot give the psychologist or physicist or biologist or sociologist viable theories and bodies of reliable knowledge. That is the task of the workers in these fields. But it can tell them (at least in theory) what is wrong with the linguistic structure of any theories they may formulate; it cannot pass upon the relevancy or reliability of the factual data upon which these theories are built.

Thus, we can state quite categorically that any set of statements, any hypothesis, any theory, in any field, as 'bad,' 'poor,' 'structurally wrong,' if it confuses levels of abstraction or reverses the natural order of abstraction; in general, they are 'bad' to the degree that they violate the three basic premises of General Semantics. We can tell if a theory is structurally wrong, but we cannot tell if it is right, for that requires observation, testing, experimentation, verification, and is the function of the workers in that field.

We shall devote the remainder of this paper to some examples and shall turn first to the field of quantum mechanics. Quantum mechanics is concerned, primarily, with the structure and functioning of individual (more or less) atomic phenomena—electrons, protons, neutrons, etc. Korzybski called this the "event" level of abstraction.

The next higher level, he called the "object" level, the level of our sensory perceptions and feelings (and the various orders or sub-levels within this level). The third level of abstraction, unique to man, is the verbal level and its various orders or sub-levels. Now it is important to remember that our perceptions—shapes, colors, tastes, sounds, etc.—require the impingement upon our sensory organs of billions of atoms, photons, etc., before we perceive something. True, the dark-adapted eye is sensitive to a relatively few photons as a 'flash', but the perception of a recognizable shape requires vast numbers of them. Consequently, our everyday world, our 'real' reality, our concepts of time, space, causality, determinism, can apply only at this object level—the level of the interaction of vast numbers of atomic 'particles' whose individual effects upon us are not perceived individually but are 'averaged out' by our sensory organs. It is a 'statistical' effect.

But when we turn to the event level and the 'behavior' of individual atomic particles and seek to explain this behavior using the language which is appropriate for the object level, we seem to be met by a host of paradoxes. Classical 'strict determinism' which had been, and still is, quite useful in predicting and explaining affairs at the object level breaks down at the event level and we find the Heisenberg principle of indeterminacy is needed to replace the strict determinism.

We ask, "Is light a particle or a wave?" And the answer is, "Neither and both"—the complementarity principle. Can an object be in two places at the same time? "No," we reply most emphatically. But an electron can—or, rather, it's never any place at any time!

As Banesh Hoffmann writes:

> These electrons and the other fundamental particles, they do not exist in space and time. It is space and time that exist because of them. These particles—wavicles, as we must regard them if we wish to mix in our inappropriate, anthropomorphic fancies of space and time—these fundamental particles precede and transcend the concepts of space and time. . . . It is out of them in the untold aggregate that we build our spatial and temporal concepts. . . .
>
> Perhaps it is this which the quantum theory is striving to express. Perhaps it is this which makes it seem so paradoxical. If space and time are not the fundamental stuff of the universe but merely particular average, statistical effects of crowds of more fundamental entities lying deeper down, it is no longer strange that these fundamental entities, when imagined as existing in space and time, should exhibit such ill-matched properties as those of wave and particle.[1]

On another page he writes:

> We have learned at last the sheer impossibility of visualizing atomic processes except in terms of the most grotesque images. We have seen what fantastic shapes our mental images must take if they would spy on that which the principle of indeterminacy veils.
>
> It was Bohr who realized these things most surely and profoundly.[2]

In a similar vein, Hanson states the problem in this fashion:

> As concerns mental pictures, the present situation in fundamental physics could not have been different. This is unpicturability-in-principle: to picture particles is to rob oneself of what is needed to explain ordinary physical objects. Though intrinsically unpicturable and unimaginable, these mathematically described particles can explain matter in the most powerful manner known to physics. Indeed, only when the quest for picturability ended was the essence of explanation within all natural philosophy laid bare.[3]

It is rather ironical to note that to his dying day Albert Einstein was not able to accept the indeterminacy principle, yet without it quantum mechanics as we now know it is impossible.

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[1] Banesh Hoffman, *The Strange Story of the Quantum* (New York: Dover Publications, Inc., 1959), p. 197.

[2] *Ibid.*, p. 170.

[3] N. R. Hanson, *Patterns of Discovery* (Cambridge: Cambridge University Press, 1958), p. 126.

Now the point of all this is that when we try to build theories about the structure of atomic particles we must not attribute to them—project onto them—the characteristics that arise when they interact in enormous clusters and produce in us as our reaction to these impingements qualities we call color, taste, sound, etc. If we do, we are confusing two different levels of abstraction, the event level and the object level. The general semanticist cannot tell the physicist what are the 'good,' 'correct' theories, but he can tell that a given theory is a poor one if it does confuse levels of abstraction. To me, the most fascinating feature in the history of the development of quantum mechanics has been the struggle of physicists to break away from theories which treated both levels of abstraction as basically identical.

Experimentation and theorizing in classical physics and in many other sciences and technologies involve the more or less 'standard' scientific procedures of reducing the system being studied to a relatively few variables. Ideally, we control or keep constant all the variables save one. By following the variations in the uncontrolled variable (or the deliberately manipulated variable) we discover 'causes' and 'effects.'

This procedure is eminently practical with systems which can be deliberately simplified. Thus, when studying the behavior of springs, the classical physicist can radically simplify his problem by assuming that the metal is absolutely uniform and that the action of the individual atoms is irrelevant. In fact, he may simplify it even further by assuming that the spring has no mass whatsoever and thus develops the theory of 'the massless spring.'

One of the main reasons for this procedure is that we are, at present, incapable of dealing with any high degree of precision with systems having more than a few unfixed variables. In other words, we choose to ignore all the vast numbers of different variables which can actually be found in the simplest of systems, by assuming that they do not have an important effect upon those aspects of the system we choose to observe.

But when we begin studying complex systems, especially living organisms, the numbers of different variables whose behavior have profound effects upon the operation of the system (and therefore cannot be ignored) we are faced with a problem analogous to that involved when we tried to describe the behavior of the individual

atoms at the event level using the linguistic structures suitable only at the object or macroscopic level.

Thus, to talk sensibly and fruitfully about, say, cell division and heredity, the number of variables which must be considered and the constant interactions among them which produce continually varying states in the system force us to deal with what Elsasser has called, "systems with immense numbers." For example, today geneticists assume that hereditary characteristics depend upon the different arrangements of between ten and twenty amino acids in the nucleic acid molecules. The number of possible arrangements of just ten different amino acids is greater than the estimated number of protons in the entire universe. And we cannot ignore any arrangement as being irrelevant because each arrangemet produces, theoretically, a different organism.

Of course, there are similarities between organisms, especially of the same species, but even in identical twins there are great differences in the relationships between the hordes of variables that make up a living organism. Elsasser writes:

> Any class of organisms is characterized by certain macroscopic properties that are measurable without major perturbation of the individual system. We shall designate such macroscopic properties as *structured* properties of the class of organism. Conversely, a class of organisms is to be defined in terms of structured properties. As we go to finer and finer microscopic details, the statistical scatter of the structured properties will become larger and their definition becomes progressively more vague; ultimately we arrive at the immense variety of molecular configuration, which much differ from one organism to the next. We can now state clearly what we mean by a physical prediction, and also by one that refers to biotonic properties. Experience shows that classes of organisms have structured properties that can be measured without major perturbations. . . . We can predict the future behavior . . . Whatever can be . . . [measured] . . . constitutes the mechanistic functioning of the organism. But owing to the coupling of organic dynamics into the immense variety of molecular configurations, these . . . [measurements] . . . will become more and more indeterminate as time goes on . . . Eventually a point will be reached where physical prediction ceases to be meaningful, being submerged as it were in an overwhelming amount of statistical scatter. Experience shows, however, that structured properties show definite regularities over exceedingly long periods of time, well beyond the range where physical prediction could yield significant results. The empirical regu-

larities so observed constitute the biotonic laws.[4]

Clearly, the structure of the language we use in describing "immense" systems must be different from that used for simpler systems. The general semanticist cannot tell what the content of this new language should be—the factual data and theories which constitute it. But he can say what it should not contain. We can just hint at the extent of the problem in this paper by referring very briefly to the "reductionism controversy."

The problem of reductionism has plagued scientists and philosophers over the ages and has become a burning and important issue in the past thirty years especially in the biological and psychological sciences. In psychology it leads to what has been called "nothingbutism." Thus, Leonardo da Vinci's creations are "nothing but" sublimations of his repressed narcissism. Religion is "nothing but" organized magic. God is "nothing but" the father image. An animal's behavior is "nothing but" a mass of conditioned stimuli and responses. Or, put perhaps a little less crudely than stated above, (or maybe more crudely) if we want to explain—"really" explain —what happens when a man perceives a green spot or thinks a given thought, we could only achieve a complete explanation if we could tell what the particular atoms in which particular cells are doing when he sees the green spot. In other words, we seek to explain a complex phenomenon by explaining the activity of its parts. Implied in this is the additivity principle—the whole equals the sum of its parts.

But this violates what Korzybski called the non-additivity principle—the whole is more than the sum of its parts. As a structure increases in complexity new characteristics arise which cannot be predicted from, or discovered by, a study of the separated parts. This becomes even more important when we study living organisms where the very functioning of the system introduces new characteristics which cannot be explained by a study of the dead parts.

We do not have to introduce any mystic "life force" as the Vitalists did in order to explain the functioning of living systems. This, in itself, is an additive theory: take some "dead" chemicals, add some "life force" and they add up to "living cell."

The presence of interacting feedback, amplifying and other homeostatic mechanisms in even the most primitive of living systems

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[4] Walter M. Elsasser, *The Physical Foundation of Biology* (New York: Pergamon Press, 1958), p. 156-157.

serves to raise it to the level of an immense system. Although General Semantics *per se* can not and does not seek to explain how any particular existent immense system—or any other real system—operates or is structured, it can state that any theory explaining them which is additive in structure is much less likely to prove fruitful than a nonadditive theory or explanation. Consequently, General Semantics can be used as a sort of negative guide. If we are faced with two or more competing theories or sets of explanations, and if the testing of them is likely to involve great expense in time, effort, money, and if at the moment we have no reliable data or compelling logic or esthetic predilection for choosing among them, place your bet and your efforts on the one which has a linguistic structure in closest accord with the principles of General Semantics.

When Korzybski formulated General Semantics the terms 'order,' 'structure,' 'function,' 'relationship,' formed the backbone of the system. The important question about any thing or process was not, "What is it?" or even, "What do we call it?", but, "What can we discern about the order and relationships of the parts; how can we describe and predict its structure and functions; what linguistic structure will serve to emphasize structure-function relationships rather than mold our thinking into the old subject-predicate form?"

It has been most gratifying to us in the field of General Semantics that this emphasis on order and orderings plays a large part in the new sciences of cybernetics and information theory. They enable us to talk with more precision about degrees of order and complexity, of relative amounts of order and complexity in two systems or in different states of a system, etc. Once again we are not saying that General Semantics invented or is responsible for the development of information theory, or that "we got there first," or "it's all General Semantics" as some critics imply we do. How silly can you get? What we are saying is that these recent developments seem to indicate that the basic structure of General Semantics is sound and that it, in turn, can be used as a metalinguistic system for linking together these recent developments into a more coherent picture of communication processes.

But more important, it can serve as a constant reminder in its negative way that there is always more to be said on any subject. If this seems to be a rather inane and obvious cliche—it is! And yet how easy it is to forget! When some computer engineers or cybernetics or information theorists view their marvelously complex and

efficient "Giant Brains" and "Game Theories" and "Decision-making Strategies' sometimes they get carried away in their excitement and admiration and seem to forget that none of these disciplines has yet discovered how to deal with the problem of "meaning" (As Claude Shannon and others have explicitly stated) or 'feelings' or 'emotions' or even 'sensations' and begin to talk about human beings as 'nothing-but' more compact and more complicated computers. Above all the negative attitude enables us to approach complexity with more open and more sane minds.

And on this note of sanity, or insanity, I close with the reminder that there is more to be said about General Semantics than its negative aspects and there is much, much more to be said about these. It has some rather forthright positive assertions in the area of values and ethics. It contains a cross-cultural, relatively non-relativistic value and ethical system embedded in it which, in practice, is inseparable from the negative assertions.

PANEL II

PSYCHOLINGUISTICS

AN APPLICATION OF PSYCHOLINGUISTICS IN LANGUAGE TEACHING: AN AUDIO-VISUAL INSTRUCTIONAL DEVICE

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The teaching machine, or rather, the programmed instruction which it presents, is one of the more recent contributions of psychology to education.[1] The teaching machine may be looked upon as an attempt to provide a controlled environment for learning. By "environment" we refer to all the stimuli impinging upon the learner and all the means available to him either for the purpose of obtaining a feedback from his responses or for obtaining new stimuli. An "ideal" environment would presumably be one in which learning could occur most rapidly, efficiently, and conveniently. The simpler forms of teaching machines which have been exploited thus far, however, are not necessarily adapted to all kinds of learning; in particular, they do not seem well adapted to the teaching of spoken foreign languages.

Even before the advent of the teaching machine, many teachers have had the dream of providing an ideal environment for second language learning. Throughout the centuries, opinion has been divided as to what kind of environment for learning a second language might be ideal. Is it the foreign language milieu in which the individual simply immerses himself in the task of trying to communicate with a foreign people on their own terms? Is it the classroom, filled with able pupils directed by an able teacher? Is it the study, in which one works with a private tutor? We have no conclusive answer to this question—certainly no answer supported by empirical research. Many believe that the private tutor—other things being equal—can provide the best "environment" for learning a second language. Obviously, not everybody can have a private tutor, but electro-mechanical devices which could fulfill many of the functions of a private tutor might be the next best arrangement. The tape

[1] For a comprehensive survey of developments, see A. A. Lumsdaine and Robert Glaser (Editors), *Teaching Machines and Programmed Learning: A Source Book* (Washington, D. C.: Department of Audio-Visual Instruction, National Education Association, 1960).

recorder in language laboratory goes far towards meeting this need; sound films have been produced which go even further.

Neither the language laboratory nor the sound film, however, provides one critical element which should be present in any ideal environment for learning—namely, the possibility of an interaction between the pupil and his environment such that the environment responds to the pupil just as much as the pupil responds to the environment. That is to say, there must be a feedback between pupil and environment. In the process by which a child learns his mother tongue, such a feedback occurs almost constantly, for the child learns to make responses which be "reinforced" (rewarded) in specific ways by people in his environment. Such feedback occurs also for the adult set down in a foreign language milieu: eventually he learns language responses which get him food, drink, and shelter. In the classroom or the private tutoring situation, interaction between teacher and pupil depends upon pupil progress. The teacher corrects the pupil, gives him extra practice, and changes the approach when the pupil has difficulty.

The question we may now raise is the following: how much of the ideal learning environment, with all its linkages and interactions between pupil and teacher, can we simulate by electro-mechanical means? How much would we want to simulate in view of the cost and practical difficulties involved? It is clear that with present technology, we have no way of simulating one important element of an ideal environment for language learning—the ability of a skilled teacher to listen to the utterances of a pupil and evaluate them. The same problem, of course, has arisen in connection with the use of the sound film or the tape recorder in the language laboratory, and the only answer provided so far is that the pupil has to be taught to evaluate his own responses. We shall have to be content with this answer, and it may be a very good answer if we will exploit it to the hilt. Aside from this, however, we find that we can indeed simulate most of the critical elements of an ideal language learning environment. With electronic computers controlling various stimulus-presentation devices such as slide projectors, tape recorders with playback features, sound films or videotapes which respond to signals from the learner, an automated learning environment can be created which comes very close to the real thing, if we are willing to spend enough money.

My own explorations in the direction of an automated environment for language learning have taken me far short of the full electronic automation that might conceivably be attempted. My goal has been, simply stated, to develop an audio-visual device for individual self-instruction in language learning which could be built for no more than the cost of, say, a color-television receiver. I have achieved this goal, in the sense that a prototype model of the device now exists and is in working order.[2] It is pictured in Figure 1.

I have also devised a program in elementary spoken and written Mandarin Chinese to illustrate the possibilities of the machine, but the material has not as yet been tried out on volunteer subjects. At this time, therefore, I can only describe the device and present in outline the ideas on which it is based.

It is my assumption that it is convenient to divide the total content of instruction into manageably-sized units which we will call *loops*. A loop contains a short sequence of instruction which one may desire to present repetitively and with certain variations in procedure as will be described below. The loops will in turn be divided into *frames*, each frame presenting a small bit of instruction or practice—ranging from a single phonemic contrast, for example, to an utterance of three or four sentences. The learning of a complex skill like the speaking and understanding of a foreign language is usually acknowledged to require considerable repetitive practice. The design of the machine thus allows the student to work with a given loop in three progressively more challenging levels or modes of operation, called respectively (1) Familiarization, (2) Learning, and (3) Testing.

Let us describe how the student would typically proceed as he works with a given loop. He will start with the machine set to the Familiarization mode. Beginning in the frame zero, he proceeds through the successive frames of the loop. (This frame is numbered zero because it is both the beginning and the end of the loop.) The work with each frame consists of three phases: first, a *presentation* phase in which the student may be given instructions, new learning material, explanations, or any other content which may help in learning; second, a *question* phase in which he is given some definite task to perform, such as answering a question; and third, an *answer* phase

[2] This machine was designed by the writer and built by Mr. S. Kingsley Roby of Saddle River, New Jersey. The writer's work has been supported by a grant from the Society for the Investigation of Human Ecology.

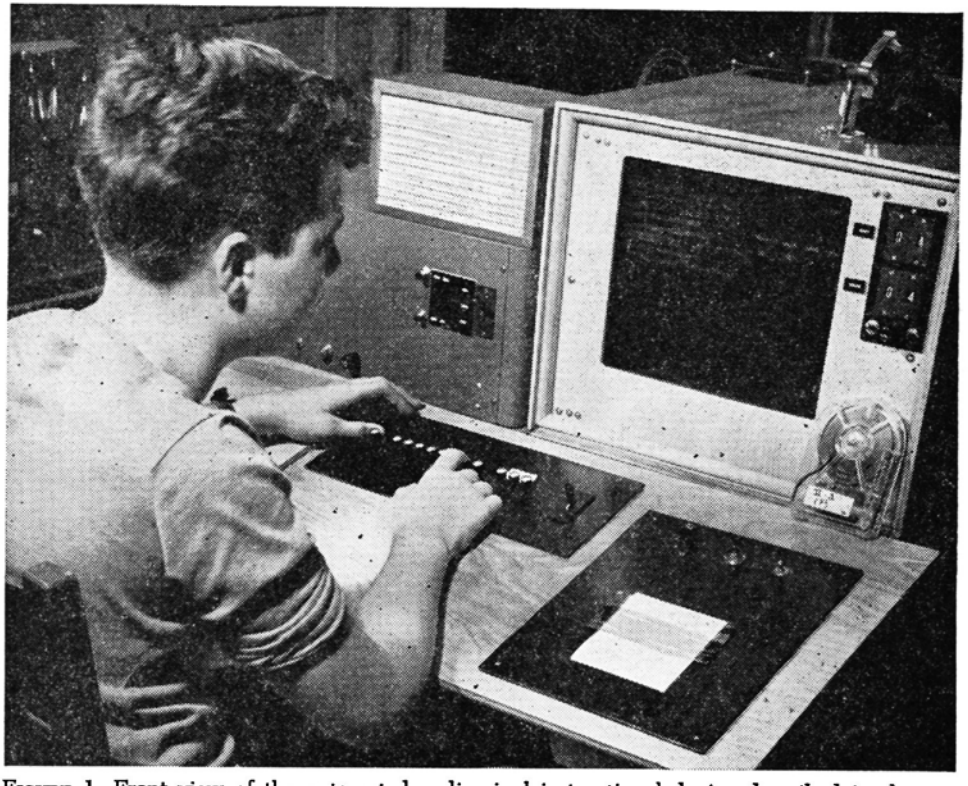

FIGURE 1. Front view of the automated audio-viual instructional device described in the accompanying article. A Sample film loop is resting on top of the box containing the projection screen; a sample magnetic tape cartridge is resting against the wall of the same box (*center right*). To the left of the projection creen are (*above*) a small loudspeaker and (*below*) a box containing relays and auxiliary controls; in the foreground is the control panel operated by the student and (*bottom right*) the write-in paper tape.

in which he is given the opportunity of finding out whether the response he made in the question phase was correct or not. When he gets to the end of the loop (Frame zero), he checks the counters which show how many right and wrong answers he made during the loop. If he got too high a ratio of wrong answers, he proceeds through the loop again, and so on until he meets a suitably high standard of performance, say, two errors in the loop or less. As soon as the student meets this standard of performance, whether on the first or a later trip through the loop, he may set the machine to the Learning mode (called so for convenience—it is not implied that learning does not take place in the Familiarization mode also). This allows him to proceed through the loop again, but now the "presentation" phase of each frame is omitted; the machine now gives him only the question and answer phases, it being presumed that he no longer needs the instructions and practice materials supplied in the presentation phase. During the question phase of a frame, however, the student may call for "prompts"—that is, hints, or cues, or partial answers which will (it is hoped) help him recall the correct answer, not only during this trip through the loop but also when he meets the same question on the next trial. As before, the student may proceed through the loop in the Learning mode as many times as are necessary to achieve a specified standard of performance as exhibited in the response counters.

After the Learning mode, the student may proceed through the loop in the Testing mode. Here, he gets only questions. He must answer solely out of what he has learned, without support of prompts or of confirmations; the answers are "for keeps." (As yet is uncertain whether the Testing mode will be necessary for efficient learning; it may be useful only from the point of view of providing evidence of achievement.)

After mastery of Loop 1 in this fashion, the student proceeds to Loop 2 and works through it in the same manner, i.e., in the three modes, then to Loop 3, and so throughout the entire series. Tentatively, it is planned that each loop will contain about 40 frames, and one trip through such a loop may take anywhere from 20 minutes to an hour depending upon the complexity of the material put into the frames. If the student at any time wishes to go back in the sequence, he can refresh himself by operating an earlier loop in the learning or testing phase. One advantage of this system over the purely linear system now favored by many psychologists is that the student who wishes to "refresh" his knowledge does not have to retrace every step

of the program. More important than this, however, is that it is not necessary to build into the program the repetitions which are apparently essential in the learning of a foreign language skill; the repetitions are a function of the way the machine is operated. This makes the programming and the storage of the program more economical than under a purely linear program. In a sense, the prototype of this machine is the memory drum, used for many years by psychologists in studying learning.[3] The program is contained in two elements.

First, the *visual* components are presented by means of a 35mm. film strip loop which is projected frame by frame. The film frame is divided into several areas, as indicated in Figure 2. The column of spaces at the right is not visible to the learner; instead, it is projected onto a bank of photoelectric cells which sense which spaces contain control marks. This information affects the operation of the machine; for example, markings may indicate whether the question presented in the frame is a constructed response question or a multiple-choice question, and if the latter, which answer is keyed correct. The remainder of the film frame is divided into a number of areas which can be exposed to the learner. One of these, the "reference area," is always visible and may contain any information or presentation which one desires to make available to the learner. Each of the others is exposed to the learner only if the corresponding shutter is opened. The order in which they are exposed will be further described below.

Second, the auditory components of the program are presented by means of a continuous magnetic tape loop cartridge. The tape contains two channels, one for the regular audio message to be heard by the learner and the other for control signals which mark the boundaries of tape segments, causing the tape mechanism to stop as soon as a signal is encountered.

Let us now move closer to the actual operation of the machine during a particular "frame." Suppose the learner is working with Loop One in the Familiarization mode. He has just finished with the introductory frame, "frame zero," and has pushed a certain button on the control panel, causing the film to advance to frame one. Immediately, the P-area of the frame one is exposed (see Figure 2), and at the same time the corresponding tape segment is played. For

[3] On this point, see David Zeaman, "Skinner's Theory of Teaching Machines," pp. 167-175 in Eugene Galanter (Editor), *Automatic Teaching: the State of the Art*, New York, John Wiley and Sons, Inc., 1959.

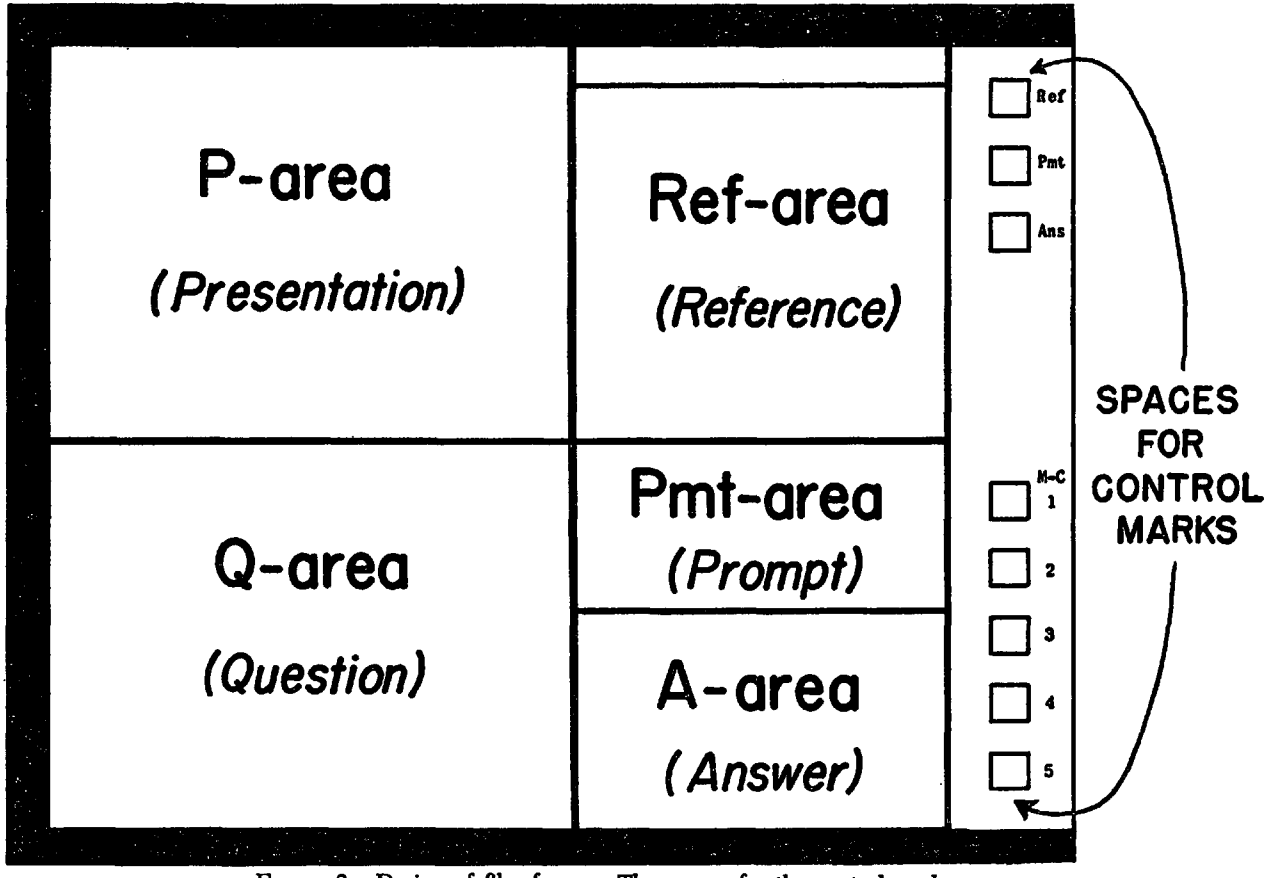

FIGURE 2. Design of film frame. The spaces for the control marks at the right are not seen by the student; each of the remaining areas may be separately exposed to him, except that the Ref-area is always visible.

example, the P-area might contain simply the printed instruction, "Listen and repeat," while the voice on the tape says, "Frame One. Repeat these words: . . . " The tape would play until a control signal on the tape is encountered. The reference area, also visible, might contain a picture to accompany the utterance. The learner would be expected to repeat aloud the foreign language utterance. Having done so, he would press a button to call for exposure of the Q-area, just below the P-area (see Figure 2) and the rendition of the corresponding tape segment. The Q-area shutter would open and the tape would again start to play, presenting some sort of question or task for the learner. It could be, for example, a multiple-choice question, in which case five buttons on the control panel would light up after the tape has finished playing, and the learner would have to press a button to signify his response. (In the Familiarization and Learning modes, the student is allowed to press one button after another until he finds the correct one, that is, the one which will advance the machine; only his first choice, however, is counted as right or wrong). If the Q-area presents a free-response task, i.e., requiring either a spoken or written response, the machine simply stops and waits for the learner to make this response to his satisfactions, after which the learner must push a buttton to advance to the next phase of the presentation. Whether the question is multiple-choice or free-response, the next phase of the presentation is the exposure of the A-area and the playing of a corresponding tape segment. These presentations furnish the learner with the correct answer, in either visual or auditory form (or both), together with any further information which one may wish to present at this time. For example, one may draw attention to some particular feature of the answer, or give special instructions concerning the evaluation of the student's response. For it is during the answer phase that the student must evaluate any free responses he was required to give during the question phase. If it was a spoken response, he will have to remember his response for a short time while comparing it with that rendered by the tape; if it was a written response, he has the opportunity of comparing it visually with what he sees in the A-area. He must then push one of two buttons which are lighted at that time, either the "R" (right) or the "W" (wrong) button, to indicate the correctness of his response. It is assumed that the student will not be tempted to cheat. He cannot cheat if the question was a multiple-choice question, for in this case the machine will already automatically have counted his first button-push (of the five lighted buttons) as either right or wrong,

and the answer-phase serves only to reinforce or explain the correct choice which he will inevitably have come around to making even if his first choice was wrong (because the machine does not "advance" to the answer-phase until he finds the correct button).

When the learner has pushed either the R or W buttons (which would be lighted in case the question had been free-response) or another button, labeled "C" (which would be lighted in case the question had been multiple-choice), the machine will advance to the next frame, and the whole sequence is repeated in whatever variation is demanded by that frame. The learner proceeds in this way until he gets to the end of the loop, "Frame zero," at which time he can decide whether to repeat the loop in the Familiarization mode, or perform the loop in the Learning mode. If he decides the latter, he moves a lever to cause the machine to operate in that mode. As mentioned previously, the Learning mode omits the presentation phase; that is, the P-area is not exposed and the corresponding tape segment is omitted. Instead, only the Q-area and the A-areas of the frame are presented, in that order, together with the corresponding tape segments. During the learning mode the student may call for "prompts;" these are purely visual and are exposed in the "Pmt-area" (see Figure 2). In the testing mode the student sees only the Q-area, and the A-area if it is necessary for him to evaluate his own answer.

Although the above description probably seems complicated and formidable, the actual operation is very simple. The buttons to be pushed during a given frame are arranged in sequence from left to right, and the choices available to be pushed at any given time are always lighted. Young children can learn to operate the machine without difficulty. The operation is so simple that the learner can concentrate on the task of learning; there is no flipping of pages, manipulation of tapes, or other distraction.

Several minor points remain to be mentioned. One is that the machine will contain a device which will enable the student to hear again any auditory signal he has heard from the magnetic tape. He will not hear this replying from the master magnetic tape itself, but from an auxiliary tape device which continuously maintains a record of the last 30 or so seconds of audio signals which have been heard at any given time. The learner can rehear only as much as he wishes, however, and this will be immediate; i.e., he will not have to wait throughout the length of the auxiliary tape. At the same time, any

signal on the auxiliary tape will gradually lose fidelity with repeated playing, thus discouraging the learner from over-use of this device.

Another point is that the machine as presently constructed contains no provision for the student to record and listen to his own spoken responses. This could easily be provided if it is found necessary, but it is believed that recording of the student's response would not be of any great assistance in learning; on the contrary, recording of students' incorrect responses may be a hindrance to learning. At any rate, there is up to now no convincing research evidence to the effect that the recording of student responses is a positive advantage in learning.

The machine contains a device whereby the student can write or draw responses on a continuous paper tape, each "frame" of written response moves up under a plastic window at the outset of the answer-phase, and then out of sight completely. The teacher or researcher can examine these tapes at a later time to get concrete evidence of student progress.

Programming for any teaching machine is tedious; programming for this audio-visual instructional device is at any rate not less tedious than for other machines, except for the fact that one is not required to program repetition as such. The materials for each loop must be carefully outlined and planned in advance. The program is prepared on large sheets of legal-size paper bearing the pattern shown in Figure 2 as well as space for drafting the script of the auditory program. These sheets are then photographed on Microfile film (negative) by an ordinary 35 mm. camera held in a special rig. The auditory program is recorded on a two-channel master tape; after this material is copied onto friction-free tape, it is packaged in continuous loop cartridges.

The basic principles underlying the design of the machine are simple:

(1) Provision is made for *maximal control* by the programmer (within feasible limits) of the stimuli impinging on the learner, particularly of their timing and sequencing; these stimuli may be either auditory or visual, or both.

(2) Provision is made for maximal versatility with respect to the kinds of responses evokable by the machine: spoken, written, or multiple-choice.

(3) The pacing of the machine is under the control of the learner, who can progress precisely as fast as he is able.

(4) The machine provides prompt confirmation of the learner's responses—normally not more than a few seconds after he has made his response.

Almost any type of foreign language instruction can be programmed for the machine. One can range from the purest of "direct-method" instruction in which all instruction is carried on in the target language with the aid of pictures and conventional symbols, to the most traditional form of grammar-translation teaching. One can program in "large steps" or in small steps. One can program so as to teach the student a knowledge of phonetics and phonemics to help him to learn a foreign language pronunciation; the audio-visual features of the machine make it amenable to programs in learning to read foreign scripts, such as Cyrillic or Arabic.

Ultimately, we may hope that experience and research will show how a machine such as this one can find its place in the equipment of the language teacher. One is given to doubt that a machine can fulfill all the functions of a teacher, even though it can go a long way. With suitable programming techniques, also, one may hope that language teaching can be made even smoother, easier, and more effective than it is under existing methods of instruction. But because this machine affords such good control over the manner in which language teaching material is presented, and indeed over the whole of the learning process, one of the most exciting possibilities of the machine is as a research tool. Since I am primarily an educational psychologist rather than a language teacher, it is with this use of the machine that I will be most concerned.

A STUDY OF FOREIGN LANGUAGE LEARNING ABILITY: PARTS I AND II

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Foreign languages, like mathematics, are often looked upon as a subject for which one either has talent or one hasn't. This view is obviously too simple, for if it were true, our foreign language classes would consist only of good and poor students, whereas in fact student achievement appears to be normally distributed. Moreover, every individual has proven himself capable of learning at least one language, his own. Clearly, some refinement of the popular notion is needed. The purpose of this study is to find out more about this so-called talent, and if possible to break it down into a number of testable components. If the major factors can be isolated, and tests devised for each, these tests should enable us both to predict how well a student will succeed in his foreign language course and to diagnose the difficulties of those who do not succeed.

This series of studies began with the formulation of some hypotheses about foreign language learning. My colleague, Robert P. Stockwell and I attempted on the basis of our teaching experience to list the factors we thought might contribute to success in a foreign language course. We listed as many as possible, including such factors as memory, the ability to reason analytically and by analogy, flexibility in changing verbal set, auditory acuity, dexterity in the use of the speech organs, interest in learning the foreign language, and others. Tests were then found or constructed for each hypothesized factor. Though the tests were made as short as possible, the amount of testing time was quite considerable. Since all the tests could not be administered in a single semester, the study was divided into two parts, which were run one year apart. The subjects each time were all students taking second-semester French at UCLA. Each sample consisted of about 200 students. By way of comparing notes with other experimenters, I may mention that the total number of students was about 300 each time, but that about one-third of the sample was lost, due mainly to the fact that if a student was absent on one of the test days, he had to be eliminated from the study. It

seems advisable always to allow for at least this much dwindling when planning an experiment.

The first study yielded data consisting of 23 test scores from each of 208 students. Of the 23 test scores, the first 21 are tests of various hypothesized factors, while the last 2 are tests of achievement in the reading and speaking skills, to be used as criteria.

On sheet number one, sides A and B, (pgs. 65-66) you will find a list of the first set of variables. Let us review them briefly. The first four are parts of the Carroll-Sapon *Modern Language Aptitude Test,* already proven to have good predictive validity. Test 5 represents reasoning of a non-verbal sort. Tests 6 and 8 represent speed of articulation. Tests 7 and 9 represent carefulness or accuracy. Tests 10, 11, and 12 are for word fluency. Test 13 is the sole auditory test in this battery. Tests 14 and 15 are for analytic reasoning applied to language materials. Test 16 is a vocabulary test. Items 17 through 21 are various pieces of information about the subject and his past history. The last two items, 22 and 23, are the two criteria: number 22 tests achievement in the traditional goals, and number 23 tests oral achievement. Presumably, a somewhat different constellation of abilities is involved in these two types of achievement.

Student scores on these 23 variables were submitted to two kinds of analysis.[1] A factor analysis was performed to determine which factors were present among the 23 variables. Then a multiple correlational analysis was performed to determine how the test variables were related to the criteria. The discussion here will focus on the findings, rather than on the methods employed. All pertinent technical information will be included in reports to appear in psychological journals.[2] It should not escape notice, however, that research tools like factor analysis and multiple correlational analysis, which are in common use in psychology, can contribute as well to the study of foreign language learning.

A factor analysis of the 23 variables resulted in eight factors, of which 7 could be identified with reasonable assurance. These results

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[1] The assistance of Dr. A. L. Comrey, of the UCLA Psychology Dept., in this phase of the research is hereby acknowledged with gratitude.

[2] We gratefully acknowledge the cooperation of the UCLA Western Data Processing Center, whose IBM 709 computer was used for all analyses except the factor analysis in part one. The latter analysis was performed on SWAC, a computer located at UCLA, and supported by the office of Naval Research.

are shown on sheet 2, side A. (pg. 68). The factors are :Reasoning ability, Fluency with words, Speed of Articulation, Verbal Knowledge, a Biographic factor whose main component is the student's sex, a factor of carefulness in work, and a specific factor of French Achievement.

Of greater interest, however, is the analysis of how the tests relate to language learning achievement. These results are shown on side B of the same sheet. Let us take each of the two criteria separately; first the traditional skills as represented by course grades, then the speaking skill. In column B, you will see a summary of the twelve tests which contribute one percent or more to the prediction of French II grades. The first is Spelling Clues, which we interpret to represent the ability to associate written symbols with sounds. The next three, Number Learning, Words in Sentences, and Letter Series, all are related to the Reasoning factor. The next test, Reading Aloud I, is of special interest. It represents a factor of Speed of Articulation and is, according to these findings, related to both criteria of language learning. The next test, the errors made on Reading Aloud II, is taken to reflect the tendency to carefulness the student brings to a task. The following test, Paraphrase, represents a factor of Fluency with Words. Phonetic Perception is the only test of its kind in this battery and consequently is difficult to interpret. It will reappear among other auditory tests in the next study. The Linguistic Analysis test is related to the factor of Reasoning. Age and bilingualism are among the pieces of biographic data gathered from the subject. And, finally, high school math-science grades are also related to Reasoning. What do these findings mean in terms of the ability to learn a foreign language? They appear to indicate that achievement in a second-semester college French course involves 1) the powers of reasoning, both analytic and by analogy, 2) the ability to associate sounds with written symbols, and 3) fluency with words, both in thinking them up and in saying them aloud.

Let us look at the second criterion, the *French Speaking Proficiency Test.* In Column E are shown the 8 tests contributing one percent or more to its prediction. The first is Spelling Clues, which we take to represent a factor of Sound-Symbol Association. The next, Words in Sentences, involves reasoning by analogy. Letter Series involves analytic reasoning. Reading Aloud I and II represent, once again, Speed of Articulation. The former involves meaningful material and the latter meaningless material. Phonetic Perception cannot be interpreted in the context of this study. Verbal Comprehen-

sion is a vocabulary test; since this is the closest thing to Verbal IQ, we are surprised that it did not play an even larger role in our findings. Bilingualism refers to those students who had a background of hearing or speaking another language in the home. Summarizing, achievement in speaking French in a college course appears to involve the ability to associate letters with sounds, knowledge of English vocabulary, the ability to articulate rapidly, and the power to reason. As we compare the results for the two criteria, we see that they appear to involve much the same capacities, but with differences in emphasis. For the speaking goal, speed of articulation and sound-symbol association come to the fore, while reasoning ability recedes somewhat.

Looking at the bottom of Columns C and F, we see the prediction of the two criteria which can be obtained by a small battery of tests. The two coefficients, .443 and .418 are neither very high nor very low. The compare favorably with previous efforts at predicting achievement in college courses. In evaluating this effort to predict success in college language study, several arguments must be kept in mind. First, the group sampled was rather highly selected. Prediction to such a homogeneous group is inevitably difficult. Secondly, we were not able to include in the first study all the tests that might be good predictors. This was largely remedied in the second study, as will be seen. The third and most important consideration is the unreliability of the criteria. We simply do not now have readily available valid and reliable tests of achievement in the various language skills. This fact is plaguing many experimenters in this field. Teacher grades were used in this study to avoid spending an hour in achievement testing. But they have rather low reliability. We substituted the Cooperative French Test for teacher grades in the second study, despite that test's shortcomings in terms of today's language teaching methods. As for the *French Speaking Proficiency Test,* evidence presented elsewhere [3] indicates that it has rather high reliability. The fact that our correlation coefficient was only .418 for this criterion can probably best be attributed to the incompleteness of the test battery used in this study.

So much for the first study. The second study again used as subjects some 200 students taking French II at UCLA, a year after the previous sample.

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[3] Pimsleur, Paul. A French Speaking Proficiency Test. *French Review,* April, 1961 (in press).

The variables included in the second study may be seen on handout sheet 3 (see pages 69-70). They were chosen so as to capitalize on the results of the first study by attempting to repeat certain of the findings, clarify others, and add new variables. Let us run down the list. Verbal Comprehension is a vocabulary test, as a measure of the Verbal factor. Linguistic Analysis I measures the ability to reason with verbal materials. Ship Destinations is a non-verbal test of analytic reasoning, included to see whether verbal and non-verbal reasoning are closely associated. Grammatical Transformations tests reasoning by analogy, using verbal materials. Paraphrase and Rhymes test the factor of fluency in thinking up words. Reading Aloud I and II test speed of articulation. The next 4 tests, numbers 9 through 12, are a variety of auditory tasks. This is one of the new factors included in this study. Another new factor, that of interest or motivation, is represented by the next two tests, numbers 13 and 14. Number 13 is a 20 item questionnaire containing such questions as:

> If I married a person whose native language was not English, I would learn his (her) language even if we both knew English.
>
> a. definitely
> b. probably
> c. possibly
> d. probably not
> e. definitely not

Number 14 simply asks the student how interested he is in the study of the language he is now studying. Incidentally, this direct approach yielded good results. Numbers 15 through 19 are pieces of biographic information which may be useful for predictive purposes. Finally, numbers 20, 21, and 22 are the three criteria. The criteria are, first, the *Cooperative French Test* for the traditional skills in place of teacher grades used and found unreliable in the first study. The second criterion is language laboratory grades as a measure of oral achievement; this had to be used in place of the more objective measure used in the last study, because of administrative difficulties involved in scoring so many speaking tests. The third criterion is the *Pictorial Auditory Comprehension Test* for listening comprehension.

The scores obtained by the 202 subjects on these 22 tests were subjected to the same analyses as before. A factor analysis yielded

eight independent factors, all of which could be identified, though with varying degrees of assurance. The results are summarized on sheet 4, side B. The first factor is ambiguous. The first three variables which compose it are the three criteria. In the previous study, they made up a separate factor of achievement in French. Here, they are associated with other variables which enter strongly into French achievement. This factor presents a picture which will be borne out by the correlational analysis, namely that verbal comprehension and interest are the best predictors of achievement in French. Factor B is clearly Speed of Articulation. The finding of interest here is that this factor fails to correlate significantly with the criteria as it did in the first study. In other words, the relationship previously found between Speed of Articulation and achievement in French, was not borne out here. Factor C, the Reasoning factor, contains both verbal and non-verbal reasoning tests. However, the two verbal tests, the last two, are the ones which correlate best with the criteria. To interpret the correlations with the criteria, found in the 3 right-hand columns, it should be borne in mind that a correlation coefficient of .12 is statistically significant at the 5% level. Factor D is a bit confusing. It associates the older boys with better vocabulary scores and yet they had poorer language grades in high school. Reading across the line for variable 17, sex, it seems clear that girls do better than boys in college French. The positive correlation between age and verbal comprehension which occurred in both studies and which led to this factorial result, is difficult to interpret. The problem is that age correlates positively with verbal comprehension scores, but not with language achievement. Factor E is Pitch Discrimination. This finding is interesting because the two tests, number 10 and 11, are quite different in nature, and yet they correlate with each other, and with French achievement. The presence of variable number 4 in this factor is difficult to explain. Factor F is Word Fluency. It is understandable that foreign subjects did less well on this task than Americans. Factor G consists of the two Interest Tests. The relatively high correlations of these tests with French achievement constitute one of the important findings of this study. Factor H is identified as Timbre Discrimination. The two tests on this factor both correlate more highly with the third criterion, the listening test, than with either of the other two criteria.

Now let us see which variables are most closely related to the criteria. On the other side of the same sheet, side 4A, may be found the results of the multiple correlational analysis. Column A presents

the contribution made by each variable to the prediction of *Cooperative French Test* scores. The use of all nineteen tests yielded a coefficient of .673. As may be seen in column B, the number of tests can be reduced considerably without effecting the accuracy of prediction very much. Shown in column B is the best six-test battery for predicting *Cooperative French Test scores.* With this modest battery which can be administered in a fifty-minute class period, a correlation coefficient of .652 is arrived at. This result compares very favorably with the results obtained in previous efforts to predict foreign language achievement. Two improvements in the second study as compared with the first probably account for the more satisfactory result. One is the use of a more reliable criterion, a standardized test, instead of teacher grades. The other is the inclusion of new variables which turned out to be quite important.

The other two criteria can each be predicted fairly well by a small battery of tests, as may be seen in columns D and F. However, the success of prediction is considerably less than in the case of the *Cooperative French Test.* This is probably due to the lower reliability of these criteria.

The regression equations for predicting each criterion with a small battery of tests are shown at the bottom of sheet 4A. They have not been validated on other subjects as yet, but they promise to compare favorably with any other predictive device now available. Validation studies are under way.

So much for the problem of prediction. But what do these results contribute to our understanding of the language learning process?

Let us examine, in column B, the various tests which make the greatest contribution toward predicting achievement as measured by the *Cooperative French Test.* They appear to represent verbal intelligence, pitch discrimination ability, interest or motivation, and two biographic elements, namely sex and languages grades obtained in high school. While the good predictive accuracy is a useful result, the way in which it is obtained gives food for thought. We see that achievement in college French cannot be predicted very well on the basis of the intellectual abilities the student may possess. Except for verbal intelligence, the biggest factor in achievement seems to be the student's attitude toward language study. This directly confirms Nida's observations as to the importance of motiva-

tion.[4] It also confirms what one may observe in the world, namely that human beings who find themselves in a foreign language society are rarely hindered for very long by ignorance of the lanuage, whatever their intelligence.

Despite this fact, it may nevertheless be of interest to look among the *intellectual* factors to see which of them are important to language learning. Variables one through 12 represent the intellectual factors, while 13 through 19 represent attitudinal and biographic factors. Looking at column A on page 4A, we see that among the intellectual variables the largest contributions are made by Verbal Comprehension, Linguistic Analysis, Rhymes, and Chinese Pitch. In factorial terms, this means that the abilities which help most in learning to read and write a foreign language in school are 1) verbal knowledge, which is closely related to verbal intelligence, 2) the capacity for reasoning, 3) fluency in thinking up words, and 4) a "good ear" for pitch, which can perhaps be generalized to include the overall intonation or "music" of the foreign language. This formulation largely reconfirms the findings of the first study, the differences being that the pitch factor is a new addition, while speed of articulation has dropped out. Sound-symbol association was not included in the second study, for lack of suitable tests and testing time, but probably should have been. As for the other goals of the language course, it is probably best to wait to discuss them until tests of proven validity and reliability are available to measure them.

The results of this series of studies are promising. They have yielded a battery for the prediction of achievement, and at least a gross break-down of the language learning process into factors, together with tests for measuring these factors. The latter point is important, for it is a large step toward the construction of a diagnostic battery by means of which to pinpoint the reasons why a substantial number of students have trouble in learning foreign languages. This series of investigations is now being pursued under a contract with the United States Office of Education.[5] Future plans involve validation of previous results on samples of high school students and with various foreign languages, and an attempt to relate foreign language learning to certain personality variables.

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[4] Nida, E. A. Motivation in second-language learning. *Language Learning*, 1956-57, 7, 11-15.

[5] Title VI, NDEA.

A FACTOR-ANALYTIC STUDY OF LANGUAGE LEARNING ABILITY: PART ONE

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The Variables

1. MLAT, Part III—*Spelling Clues.* The subject chooses which of five words has the same meaning as the word represented in abbreviated form. Sample: kataklzm = 1. mountain lion; 2. disaster; 3. sheep; 4. chemical reagent; 5. population. Highly speeded: 50 items; 8 minutes.
2. MLAT, Part I—*Number Learning.* By tape recording, the subject is taught a simple artificial system of number expression utilizing nonsense syllables. He is then asked to write down the Arabic numeral equivalents of a list of 2- and 3-digit numbers in the artificial system spoken at a fairly rapid pace on the tape. This version utilizes the digits 0, 1, 2, 3, 4. Fifteen items. Total time: 10 minutes.
3. MLAT, Part IV—*Words in Sentences.* This test was designed to measure the ability to understand the function of words and phrases in sentence structure, without calling on knowledge of grammatical terminology. Each item consists of a "key sentence" with a word or phrase capitalized, followed by one or more sentences with other words or phrases underlined and numbered. The subject is directed to pick the word or phrase in the second sentence (or sentence-group) which does the same thing in that sentence as the capitalized word does in the key sentence. Sample:

   He spoke VERY well of you.
   Suddenly the music became *quite loud.*
   1 2 3 4

   The test contains 45 items. The time allowed is 15 minutes.
4. MLAT, Part V—*Paired Associates.* The subject studies a list of 24 "Kurdish-English" vocabulary equivalents for two minutes; in the next two minutes he practices recalling the English meanings, and he then has four minutes to complete from memory a multiple-choice test of the presented vocabulary (24 items).
5. *Letter Series.* (Adapted from Guilford). A series of seven letters is given, to which the subject must add the next two. Sample:

   D E F D E F — —.
6. *Reading Aloud*—I. (speed). The subject is given time to study a meaningful paragraph of English prose, then is asked to record his reading of it, "speaking as quickly as possible while still remaining intelligible." Score is number of words read in thirty seconds.
7. same test—(accuracy). Number of errors made in 6.
8. *Reading Aloud—II.* (speed). The subject is given time to study a meaningless paragraph made up of English words put together at random. He then records his reading of it "speaking as quickly as possible while still remaining intelligible." Score is number of words read in thirty seconds.
9. same test—(accuracy). Number of errors made in 8.
10. *Paraphrase.* The subject is to give as many paraphrases as possible for a given phrase. Sample: for TO DIE, the subject might give "to kick the

bucket," "to cash in one's chips," etc. Score is number of paraphrases given in four minutes.

11. *Rhymes.* The subject is to give as many words as possible that rhyme with four given words (LAKE, CLOUD, SO, GRASS). Score is number of rhymes given in two minutes.
12. *Synonyms.* The subject is to give as many synonyms as possible for four given words. Sample: for GO, the subject might give "ride," "drive," "fly," "travel," etc. Score is number of synonyms given in four minutes.
13. *Phonetic Perception.* The subject hears three sounds and must tell which one is different from the other two. The test uses distinctions which are non-phonemic in English (e.g. 'r' vs. 'rr'). Twenty items, five minutes.
14. *Linguistic Analysis—I.* The subject is given a list of 22 foreign forms (adapted from Kabardian) together with their English equivalents. By consulting the given forms, he is to deduce how other things are said in this language. Ten multiple-choice items, twelve minutes.
15. *Linguistic Analysis*—II. The subject is given a list of 19 forms in a foreign language (adapted from Kabardian) together with their English equivalents. By consulting the given forms, he is to deduce the meanings of a number of other foreign forms given to him. Ten multiple-choice items; twelve minutes.
16. *Verbal Comprehension* (Guilford-Zimmerman). A test of English vocabulary knowledge. Forty items; six minutes.
17. *Age.* The subject gives his age at last birthday and is placed in one of five categories: under 18, 18-20, 20-22, 22-25, over 25.
18. *Sex.* Female or male, scored zero or one.
19. *Bi-Lingualism.* To be rated as "bi-lingual" a subject has to answer either or both of the two following questions affirmatively: 1) Is a language other than English spoken regularly in your home? 2) Is your native language other than English? Scored zero for mono-, one for bi-lingualism.
20. *High School language grades.* An average of grades in high school language courses.
21. *High School math-science grades.* An average of grades in math and science courses in high school.
22. (criterion) *French II final grades.* Letter grade assigned by teacher at end of second semester of college French. (A, B, C, D, F = 4, 3, 2, 1, 0).
23. (criterion) *French Speaking Proficiency Test.* A five-part recorded test of ability to speak French at end of second semester. Scored by native judges.

A STUDY OF FOREIGN LANGUAGE LEARNING ABILITY: PART ONE

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SUMMARY OF FACTORS

Identification	Variables	Loading	corr. with 22	corr. with 23
A. Analytic Reasoning	2. Number Learning	.57	.30	.09
	21. H. S. math-sci. grades	.50	.22	.07
	14. Linguistic Analysis—I	.48	.14	.10
	3. Words in Sentences	.43	.30	.16
	15. Linguistic Analysis—II	.35	.22	.17
	5. Letter Series	.34	.21	.22
	22. French II grades (crit.)	.34	(1.00)	.48
B. Word Fluency	10. Paraphrase	.65	.14	.03
	12. Synonyms	.64	.05	.06
	11. Rhymes	.41	.14	.10
C. Biographic	18. Sex	.64	—.02	—.08
	20. H. S. language grades	—.58	.17	.16
	17. Age	.52	.08	.02
	4. Paired Associates	—.34	.16	.13
	3. Words in Sentences	—.31	.30	.16
D. Achievement in French	23. French Speaking Test (crit.)	—.65	.48	(1.00)
	22. French II grades (crit.)	—.57	(1.00)	.48
E. Speed of Articulation	8. Reading Aloud—II (speed)	—.71	.14	.22
	6. Reading Aloud—I (speed)	—.68	.20	.21
F. ?	5. Letter Series	—.42	.21	.22
	13. Phonetic Perception	—.37	—.01	—.02
	19. Bi-lingualism	.34	.09	.09
	14. Linguistic Analysis—I	—.32	—.14	.10
G. Doublet	9. Reading Aloud—II (errors)	—.48	—.14	—.06
	7. Reading Aloud—I (errors)	—.44	.01	—.07
H. Verbal	16. Verbal Comprehension	.59	.20	.29
	1. Spelling Clues	.43	.18	.24
	11. Rhymes	.37	.14	.10

MULTIPLE CORRELATIONAL ANALYSIS

Proportions of variance in test batteries of different sizes.

Variables	French II Grades			French Speaking Test		
	A 21 tests	B 12 tests	C 7 tests	D 21 tests	E 8 tests	F 5 tests
1. Spelling Clues	.033	.033		.058	.057	.058
2. Number Learning	.025	.025	.036	.002		
3. Words in Sentences	.047	.047	.063	.007	.009	
4. Paired Associates	.002			.003		
5. Letter Series	.008	.008		.019	.019	.024
6. Reading Aloud I (speed)	.021	.022	.029	.023	.024	
7. Reading Aloud I (errors)	.000			.003		
8. Reading Aloud II (speed)	.002			.010	.011	.027
9. Reading Aloud II (errors)	.014	.012		.001		
10. Paraphrase	.009	.011	.012	.001		
11. Rhymes	.001			.000		
12. Synonyms	.000			.000		
13. Phonetic Perception	.005	.006		.008	.008	
14. Linguistic Analysis I	.000			.000		
15. Linguistic Analysis II	.010	.010	.012	.004		
16. Verbal Comprehension	.002			.036	.036	.044
17. Age	.012	.012	.012	.002		
18. Sex (fem=0, masc = 1)	.001			.001		
19. Bilingualism	.022	.021	.024	.028	.023	.023
20. H. S. language grades	.004			.000		
21. H. S. math-science grades	.008	.012		.001		
22. French II Grade (crit.)						
23. French Speaking Test (crit.)						
	R=.478	R=.468	R=.433	R=.454	R=.432	R=.418

A STUDY OF FOREIGN LANGUAGE LEARNING ABILITY: PART II

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The Variables

1. *Verbal Comprehension* (Guilford-Zimmerman). A test of English vocabulary knowledge. Forty items; six minutes.
2. *Linguistic Analysis—I.* The subject is given a list of 22 foreign words and phrases (adapted from Kabardian), together with their English equivalents. He is to deduce how other things are said in this language, by analogy with the given ones. Ten multiple-choice items; twelve minutes.
3. *Ship Destination Test* (Christensen-Guilford). Find the distance from ship to port considering the influence of several variables. Thirty-three items; fifteen minutes.
4. *Grammatical Transformations.* The subject is given a sample transformation (e.g., "They are good. Books are interesting." "Good books are intesting.") In a new item, he is to select from among four choices the one which represents a transformation similar to the sample. (E.g., "It is noisy. Telephones are annoying." Noisy telephones are annoying.) Twenty items; nine minutes.
5. *Paraphrase.* Give as many paraphrases as possible for a given phrase. Sample: for TO DIE one might give "to kick the bucket," "to cash in one's chips," etc. Score is number given in four minutes.
6. *Rhymes.* Give as many words as possible which rhyme with four given words. Score is number given in two minutes.
7. *Reading Aloud—I.* The subject looks over a paragraph of normal English prose, then is asked to read it aloud, "speaking as quickly as possible while still remaining intelligible." Score is number of words read in thirty seconds. Subject scores himself.
8. *Reading Aloud—II.* The subject looks over a meaningless paragraph of English words put together at random. Then he reads it aloud "as quickly as possible while still remaining intelligible." Score is number of words read in thirty seconds. Subject scores himself.
9. *Phonetic Perception.* Tell which of three sounds differs from the other two. Test uses distinctions which are non-phonemic in English (e.g., 'r' vs. 'rr') Twenty items; five minutes.
10. *Chinese Pitch Perception.* Subjects are taught three Chinese words which differ only in pitch. These are then imbedded in Chinese sentences and subject must tell which he hears. Thirty items; ten minutes.
11. *Seashore Pitch Test.* Subject hears two tones, must tell whether the second is higher or lower than the first. Thirty-five items; five minutes.
12. *Seashore Timbre Test.* Subject hears two chords; must tell whether the second is the same as or different than the rest. Thirty-five items; five minutes.
13. *Interest—I.* Twenty items relating to interest in languages. Subject answers each on a five point scale. Five minutes.

14. *Interest—II.* The subject is asked to rate on a five point scale the extent of his interest in studying the foreign language he is now studying.
15. *Bi-lingualism.* The subject is asked for information concerning his language background. Scored zero for monolinguals, one for bi-linguals.
16. *Age.* Subject is asked for his age at last birthday. Coded from one to five, as follows: under 18, 18-20, 20-22, 22-25, over 25.
17. *Sex.* Female or male, scored zero or one, respectively.
18. *High School language grades.* An average of self-reported grades in language courses in high school.
19. *High School math-science grades.* An average of self-reported grades in math and science courses in high school.
20. (criterion) *Cooperative French Test, Advanced Forms Q and R.* A standardized test of achievement in reading and writing goals. Total scores used in this experiment.
21. (criterion) *Lab grade.* An estimate of speaking ability given by laboratory instructor on the basis of listening to student's oral work all semester, plus a final oral test. Grades from zero to eleven.
22. (criterion) *Pictorial Auditory Comprehension Test.* An objectively-scored test of French listening comprehension. Subject must select from among four pictures the one which correctly illustrates the sentence he has just heard. Tape recorded. Fifty items; twenty minutes.

TABLE II

Proportion of variance contributed by each variable to the prediction of each of 3 criteria: using a 19-test battery; using the most economical battery.

	Criterion 20: Coop. French Test		Criterion 21: lab (oral) grades		Criterion 22: Auditory Comp.	
	A 19 tests	B 6 tests	C 19 tests	D 5 tests	E 19 tests	F 5 tests
1. Verbal Comp.	.193	.193	.021	.021	.075	.075
2. Ling. Anal. I	.017		.001		.030	.030
3. Ship Destination	.000		.000		.000	
4. Grammat. Xform.	.004		.002		.001	
5. Paraphrase	.000		.000		.004	
6. Rhymes	.010		.015		.003	
7. Reading Aloud I	.002		.006		.000	
8. Reading Aloud II	.001		.018		.001	
9. Phonetic Perception	.001		.002		.008	
10. Chinese Pitch	.019	.024	.005		.011	.015
11. Seashore Pitch	.000		.000		.002	
12. Seashore Timbre	.004		.000		.009	.013
13. Interest I	.123	.125	.040		.032	.031
14. Interest II	.020	.021	.009	.052	.001	
15. Bi-lingualism	.007		.003	.009	.000	
16. Age	.006		.008		.000	
17. Sex	.022	.037	.013		.003	
18. H. S. language	.019	.024	.048	.073	.005	
19. H. S. math-sci.	.003		.016	.013	.005	
	R=.673	R=.652	R=.457	R=.410	R=.436	R=.405
	$Y'=47.37+.47X_1+.18X_{10}+.09X_{13}+1.21X_{14}-2.15X_{17}+1.82X_{18}$		$Y'=3.25+.04X_1+.31X_{14}+.64X_{15}+.98X_{18}-.37X_{19}$		$Y'=17.80+.25X_1+.37X_2+.13X_{10}+.16X_{12}+.09X_{13}$	

TABLE III

SUMMARY OF FACTORS

Identification	Variables	Loading	corr. with 20	corr. with 21	corr. with 22
A. Achievement in French (Verbal)	20. Coop. French Test (crit.)	.733		.476	.509
	21. lab oral grade (crit.)	.552	.476		.359
	22. aural test (crit.)	.518	.509	.359	
	1. Verbal Comprehension	.467	.440	.145	.274
	18. High School language	.440	.358	.330	.168
	13. Interest—I	.350	.439	.250	.232
	17. Sex	—.312	—.310	—.178	—.114
B. Speed of Articulation	8. Reading Aloud—II	.765	—.006	.128	—.023
	7. Reading Aloud—I	.711	.039	.070	.000
	19. High School math-science	.514	.076	—.017	.019
C. Reasoning	3. Ship Destination Test	.462	.075	.003	.052
	2. Linguistic Analysis—I	.372	.127	.032	.171
	4. Grammatical Transformations	.319	.163	—.011	.071
	16. Age	.564	.021	—.049	.095
D. Biographic	1. Verbal Comprehension	.393	.440	.145	.274
	17. Sex	.365	—.310	—.178	—.114
	18. high school language	—.305	.358	.330	.168
	11. Seashore Pitch Test	.495	.105	.064	.126
E. Pitch Discrimination	10. Chinese Pitch Test	.438	.175	.099	.134
	4. Grammatical Transformations	.369	.163	—.011	.071
	5. Paraphrase	.504	.076	.020	.117
F. Word Fluency	6. Rhymes	.409	.156	.128	.111
	15. Bilingualism	—.384	—.060	.098	.003
G. Interest in Languages	14. Interest—II	.696	.338	.228	.164
	13. Interest—I	.674	.439	.250	.232
H. Timbre Discrimination	9. Phonetic Perception	.356	.096	.084	.142
	12. Seashore Timbre Test	.345	—.024	.058	.137

BEHAVIORAL EVIDENCE FOR CONTRASTING FORMS OF BILINGUALISM [1]

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It is a special pleasure for me, a psychologist, to be asked to talk to you about some of our work on language behavior. This is so because I have a personal conviction that neither linguists nor psychologists have become fully aware of the fact that both are studying often the very same phenomena of language with distincitvely different methods, schemes of analysis, and ultimate purposes in mind. In light of these differences, when linguistic and psychological facts or laws do make contact or coincide, their significance for each discipline becomes appreciably richer and more meaningful. Opportunities extended to me by the Social Science Research Council's Committee on Linguistics and Psychology to meet with linguists for long periods have demonstrated clearly the value of contact for both groups. I don't believe that the fruitful consequences of contact require that we know one another's business or jargon to any great extent as long as both groups are willing to share major ideas, stating them in simplified terminology.

I hope that what I have to say here about bilingualism will illustrate the psychological approach to this fascinating topic. I have been helped in my work by my contact with Uriel Weinreich and Einar Haugen. I responded to their linguistic perspective of bilingualism as a psychologist. Whether they or other linguists will respond in turn to my psychological interpretation of bilingualism, thereby completing the cycle of contact, I can't really judge, but I do hope so.

The phenomenon of bilingualism had been examined by the more speculative, former generation of linguists long before psychologists considered it of special interest. In an exhaustive review of the literature on this topic, Weinreich (1953) reports several publications in which two forms of bilingualism have been identified.

[1] The work discussed here has been supported by the Canadian Defense Research Board and more recently by the Carnegie Corporation by grants to the Language Research Group at McGill.

Linguists have used various names to distinguish the two, e.g. "pure versus mixed," "organic versus inorganic," "subordinative versus coordinative." The distinction between the two forms has been made on the basis of differences in linguistic behavior of bilinguals such as the general or specialized usage of one or both languages, proneness to translate from one language to the other, or differences in connotations of words which are supposedly equivalent in the two languages.

The psychologist's interest in bilingualism centers on the effect upon verbal behavior and thinking of the acquisition and usage of two systems of signs. Following Osgood's development of a theory of meaning (1953) which uses a mediation principle as its pivotal concept, Ervin & Osgood (1954) formulated a theory of bilingualism which incorporates the linguist's notion of a bilingual dichotomy and relates the two types to the manner in which bilinguals acquire and use their languages.

Ervin & Osgood argue that the "meaning" of a sign (or word) is identical to the representational mediation process which that sign elicits in the organism. The mediation process is some form of neutral-system replica of the original reactions made to the referent or object signified by the sign. A "compound bilingual" is defined as one who possesses two sets of equivalent signs (one in each language) for the same class of referents. For example, the meaning of the English word "house" is identical with the meaning of its French equivalent "maison" since both these signs elicit the same mediators. A "coordinate bilingual" is defined as one who possesses two sets of signs which have comparatively less equivalence because the situations in which the two languages were learned were contextually separated and in some cases the actual referents of signs in the two languages are not identical or equivalent. Thus, the word "house" elicits its appropriate mediation process, while the word "maison" elicits a mediation process which is different to some degree from that elicited by "house." The coordinate may learn to translate "house" by "maison" as well as note the similarities between the objects referred to by the two signs, but the meaning of these two words will remain different, usually being subjectively experienced as a difference in connotation or appropriateness of reference.

From these definitions, specific kinds of language experiences are conducive to the formation of compound and coordinate bilingual

systems. Thus, the so-called "indirect" method of language learning (e.g., "maison means house," taught in the classroom) favors the development of compound billingualism since the new sign ("maison") is directly conditioned to the mediators already existing for the sign "house." It is evident that all meanings which are assigned are of the compound type. In contrast the "direct" method of language learning promotes coordinate bilingualism. Also, bicultural experience such as the use of French exclusively in France by an Englishman, favors the development of a coordinate system since the French signs tend to be conditioned or re-conditioned to new referents and experiences. "Specialization" in language usage (e.g. using French exclusively at home but English at work in bilingual communities) also promotes a coordinate system since the two languages are likely to become functionally independent.

We were first interested in testing the mediation theory of bilingualism by examining certain behavioral manifestations of the functional dependence or independence of bilingual language systems and relating these to the manner in which bilinguals learned their two languages (see Lambert, Havelka & Crosby, 1958). We contacted a large number of English-French bilinguals and interviewed them extensively in order to be confident in categorizing them either as *coordinate* if their languages were learned in situationally, culturally, or temporally distinctive settings, or as *compound* if the two languages were learned in essentially the same situation or through translation methods, or if they were used interchangeably. We also tested their comparative skill in the two languages and kept in our samples only those who were "balanced" in their bilingual skill (see Lambert, 1955).

Our first idea was to see how well compound and coordinate bilinguals would be able to keep their languages independent in a learning task. Each bilingual was given a list of 20 English words to memorize and then was given a second list to learn, the second list consisting of translation-equivalent French words for each of the original 20 English words. Here's the problem: from the theory, we predict that coordinates would keep their two languages separated in this task while compounds would show an interaction of the two languages. The results support this prediction clearly since compounds were able to profit from the interpolated French-equivalent list of words and *improved* their retention of the original English list while coordinates were disrupted by the translation equivalents and even forgot much of the original English list. That is, learning

a series of words like "father, garden, church," etc., is more vividly remembered by compound bilinguals after they have rehearsed a series of equivalents such as "père, jardin, église," etc., while coordinates are bothered by the learning of the equivalents.

Our next prediction was that compound bilinguals would have more similar meanings for translated equivalents than would coordinates. Here we examined the two groups' patterns of meanings of translated equivalents using Osgood's semantic rating procedure (see Osgood, et al, 1957) which was designed to measure connotative meanings of words. The results are clear: if coordinate bilinguals learn their languages in culturally distinctive settings then they have comparatively different patterns of meanings for common words such as house and maison, poor and pauvre, me and moi than have compound bilinguals. That is, the meanings of equivalents such as "house-maison" or "poor-pauvre" are more distinct for coordinates who have learned their two languages in culturally segregated settings than for compound bilinguals. This finding does not hold for coordinates who have learned their languages in situationally segregated contexts within one cultural setting as in Montreal. Semantic distinctiveness apparently demands quite contrasting acquisition contexts whereas functional independence of the two language systems as noted in the memorization problem is developed more readily in a greater range of distinctive settings, not necessarily culturally segregated ones.

Our third test of the theory involves a new idea. Suppose we could by some method eliminate or reduce the meaning of a word in one language, what would be the effect of this meaning reduction for equivalents in the other language? We would predict that compounds would manifest the reduced meaning cross-linguistically whereas the coordinates should not show as much of any cross-linguistic effect from meaning reduction in one of their languages.

We have developed a method for reducing the meaning of a word by repeating it until its meaning is "satiated" (see Lambert & Jacobovits, 1960), for example repeatedly saying "house, house, house, etc." for a 15 second period. When measured on semantic rating scales, it is observed that the intensity of connotative meaning is systematically reduced by word repetition.

Groups of French-English coordinate and compound bilinguals were tested for cross-linguistic satiation. Concepts such as "cuisine" or "father" were continuously repeated by a subject for a 15 sec.

period and then the translated-equivalents ("kitchen" and "père") were presented one time and the extent of meaning change was measured for these translated-equivalents. The compound bilinguals behave as expected here: repetition of "cuisine" reliably reduces its connotative meaning and that of its equivalent, "kitchen." The coordinant bilinguals, however, show no reliable satiation of the meaning of repeated words nor do the translation-equivalents reflect a cross-linguistic satiation effect. In fact, continuous repetition of a word in language A actually *increases* the intensity of meanings of translation-equivalents in language B (see Jakobovits & Lambert, 1932). We have more work to do on this problem but at present we feel that these results are highly suggestive of quite different (and intriguing) processes underlying compound and coordinate bilingualisms.

We have made other deductions from the psychological theory of bilingualism which were not supported and as a consequence of attempting to explain these cases, we have been led to new predictions and to likely modifications of the theory. I have only time enough to give you the general outline of these studies and the new ideas stemming from their findings. Compound and coordinate bilinguals were asked to learn a mixed series of English and French words and to remember which words were associated with electric shock—a slight one administered to one finger. It wasn't long before the word "verte" or "boy," for example, would lead to a rapid pressing of a key which eliminated the occurrence of shock. After this habit was well learned, we introduced (along with other new control words) the translations of shocked words such as "green" and "garçon." Here we expected compound bilinguals to be more prompt than coordinates in pressing the key for the other-language equivalents of shocked words, arguing that the association of shock with "verte" for compound bilinguals would more likely also associate with "green" than would be the case for coordinates whose languages we assume function more independently. But we found no differences between the groups here (see R. Olton, 1960).

In a further procedure (R. Olton, 1960) bilinguals learned a mixed list of English and French words and later were presented a longer list and asked to pick out the words memorized from among new words and translation-equivalents of those originally learned. For example, "glove" and "printemps" might have been on the list to be learned originally while only their translations ("gant" and "springtime") would be on the final list. Thus the subjects were

forced to switch languages rapidly in memorizing the list but also remember which words appeared in which language. We would predict that compounds would make more errors in confusing "glove" with "gant" than would coordinates, but no reliable differences appeared. In both procedures all bilinguals showed cross-language generalizations, a finding of importance for the theory of mediated generalization. For the compound—coordinate problem, however, the results either indicate that these tests were too subtle or poorly executed, or that the procedures used prompted both groups to behave in a translation—alert manner, making coordinates appear as compounds.[2] This latter line of reasoning has led us to a new hypothesis concerning various procedures which involve rapid language switching and their effects on the thinking of bilinguals. The central notion under current examination is that experimental procedures which encourage a readiness to switch languages may modify the behavior of coordinate bilinguals and make them indistinguishable from compounds. We hope to be able to delineate such conditions, if they exist.

Psychology can of course make profitable contacts with other disciplines than linguistics. I have found it particularly interesting in the study of language to be sandwiched between linguistics on one side and physiological-psychology on the other. McGill University offers a splendid opportunity to learn about the important work of Hebb and Milner as well as Penfield and his associates. Donald Hebb in particular has encouraged me to think about the possible neurological implications of our work. In his recent book (D. O. Hebb, 1958, p. 104f) Hebb outlined one manner in which groups of neurological cells could function as either "fused" or "separated" systems—hypothetical neurological analogues of compound and coordinate systems.

Hebb's thinking suggested the possibility of indirectly testing the neurological features of compound and coordinate bilingualism. A long history of medical reports are available on bilinguals who have become aphasic, sometimes "losing" one of their two languages, other times "losing" both. We went through the published cases (mainly compiled in Europe) to determine if compound and coordinate classifications could possibly be made on the basis of how aphasic bilinguals originally acquired their two (or more) languages.

[2] This possibility might also account for our failure to find compound-coordinate differences in speed of translation mentioned in the Lambert, Havelka, Crosby study.

The findings of this study (Lambert & Fillenbaum, 1959) are of special interest because they suggest the possibility of someday linking linguistic, psychological and neurological principles. The argument here is that the functional relations of the bilingual's two languages have some systematic neurological representation in those areas of the brain necessary for language. In view of the behavioral evidence of functional dependence or independence of bilinguals' languages, we speculated that coordinate bilinguals should have more functionally separate neural structures underlying their languages than should compound bilinguals. Thus, concepts like "church" and "église" should be stored in neural elements which have some sort of greater functional discreteness for the coordinate bilinguals. It follows that brain damage which results in aphasia would be more likely to affect both languages of the compound bilingual but should lead to more selective disturbances for coordinates. The results of our analysis of aphasic patients are in line with these predictions: those cases which suggest a compound bilingual background typically show a generalized disorder affecting both languages whereas those cases with a coordinate bilingual background typically show more specific-language disorder following aphasia.

Throughout these studies, a psychological theory, based on the thinking of Charles Osgood and Donald Hebb, has functioned as an analytic guide. It generated a host of predictions, the testing of which has extended our understanding of bilingual behavior. The general picture is getting progressively clearer: converging evidence dealing with the learning and thinking processes of bilinguals supports the notion of functionally dependent language systems for those who acquire their two languages in a compound fashion and of functionally independent systems for those who acquire their languages in a coordinate fashion. Still there are certainly many intriguing features to be uncovered which have not even been conceptualized as yet.

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CONNOTATIVE MEANING OF SEVERAL INITIAL CONSONANT CLUSTERS IN ENGLISH

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The descriptive linguist analyzes phonemic data in order to isolate recurring minimum sequences of phonemes that function in a constant and unique way. The phonemes, or sequences of phonemes, so isolated, manifest the morphemes of the language. After the morphemes, or strictly speaking, the allomorphs, of the language have been tentatively established, the linguist is aware that some of them, especially the longer sequences, might possibly contain two or more morphemes. For any sequence to be established as a member of a morpheme the criteria are 1) that it have a unique and constant grammatical function in relation to other such sequences, and 2) that the residue of the utterance must be accounted for by the same criterion.

There are certain consonant clusters that occur over and over again in English. It was my impression that many of the words in which some of these clusters occur share an element of connotative meaning. For example, the initial consonant cluster *gl*—appears in the following frequently appearing words: *glad, glance, glass, gleam, glimpse, glitter, globe, glorious, glove, glow.* It was my subjective impression that these words share an element of connotative meaning. Since they also share *gl*—, I was prompted to speculate, as others have before, for example Bloomfield in 1933, that it is the consonant cluster that carries the shared element of connotative meaning. The study I am reporting today was conducted to investigate the possibility that there is a "connotative meaning" attached to this consonant cluster *gl-*, and four other frequently occuring consonant clusters, and to specify, with some degree of precision, some aspects of these meanings. An expanded version of this paper is to be published in the fall, 1960 issue of Studies in Linguistics, with Eric P. Hamp as co-author.

From the inventory of initial consonant clusters that occur in English, five were selected that occur relatively frequently, and which also seem to carry connotative meaning: *gl, fl, sm, sp,* and *st.* Of these, *gl, fl* and *sm* seemed to carry quite marked connotative meaning, and the other two, *sp* and *st,* seemed weaker in this respect.

Since the stimuli were to be presented aurally, a syllabic ending for the five consonant clusters had to be selected to make them pronounceable. The two considerations for the choice of this syllabic ending were its reproduceability in a constant manner over a long series of utterances, and its acceptability to native speakers, when attached to any one of the consonant clusters, as structurally normal English. A further consideration was the problem of estimating the influence of the syllabic ending on the connotative meaning of the consonant clusters. In a number of studies reporting on phonetic symbolism, there seems to be agreement on the value of the syllabics that are usually labled *i* and *a*, at least to the extent that they are opposite in meaning.

These syllabics were interpreted to be what would be written in Trager-Smith *phonemic* transcription of English as /iy/ and /ah/. Both /iy/ and /ah/ are reproduceable in a constant manner over a long series of utterances, and, if attached to any one of the five consonant cluster and followed by terminal juncture, they do not sound "foreign" to an American English speaker. Furthermore, by using both /iy/ and /ah/ with each consonant cluster their effect on the meaning of the consonant cluster could be compared, at the same time avoiding the dangers of an unquantified built-in bias. The combination of /iy/ and /ah/ with the five consonant clusters produced ten stimuli: *gliy-glah, spiy-spah, fliy-flah, smiy-smah, stiy-stah.*

The semantic differential technique, as developed by Osgood, was used to obtain measures of connotative meaning. In this technique, the subject has before him an adjective pair, which is separated by seven spaces, marked off by colons. Section A on the handout indicates the format of the semantic differential technique. The subject is asked to listen to the stimulus, and then place a check mark in one of the spaces between the adjectives, according to how he "feels" about that stimulus. This study used the fifteen adjective pairs that are listed in Section A. (Pg. 87). The pairing of each of these 15 adjectives pairs with each of the 10 stimuli yielded a 150-item test. Two randomizations established which adjective of the pair appeared first, and second, the order of the 150 items.

The stimuli were recorded on tape by Eric Hamp, and were presented at five second intervals. Both the number of the item, and the stimulus itself were presented with a constant and distinctive intonation contour: 22 || for the number of the item, and 31 # for the stimulus. For example: ^{2}óne^{2} || ^{3}smíy^{1} #; ^{2}twó^{2} || ^{3}gláh^{1} #. The 22 ||

on the numbers is the usual "suspense" intonation, and 31 # on the stimulus is the "favorite pattern" of English statements. Ancillary vocalizations were limited to those regularly associated in our culture with colorless delivery.

It will of course have been noted that three of the stimuli are homophonous with English words: *glee, flee, and spa.* In choosing the stimuli it was felt that this factor was not as important as the ability of the stimuli to meet the stated criteria; that is: 1) consonant clusters that occur frequently in the language, 2) syllabics for which meaning had been established in the literature, and 3) stimuli that would not sound foreign to American English speakers. In addition, in considering the amount of time the test would take, it was considered more important at this stage of research to have a larger selection of adjective pair scales for judgement than a larger selection of stimuli. Since each stimulus was judged independently with each adjective pair scale, not in contrast to another stimulus, and since the presentation of the stimuli and adjective pairs was completely random, it is felt that this aspect of the experimental design does not detract from the essential purpose of the study. On more theoretical grounds, if a certain stimulus which happens to occur as an actual English word was judged, as a direct result of the informant's denotative associations with this word, to carry a given connotative meaning, presumably it is precisely this lexical denotation that contributes, at least in part, to the connotative meaning attributed to that stimulus.

The test was administered to 103 students in summer school English classes at the University of Illinois, Navy Pier, Chicago. Of the 103 students, 48 met the following criteria: 17-21 years of age; native speakers of American English; no training in descriptive linguistics. The results of the present study are based on the responses of these 48 students.

To score the semantic differential the spaces between the adjective pairs were numbered from one to seven, the lowest number always assigned to the adjective that appeared first in our original list. This was done so that the scoring of pairs, which as a result of randomization, appeared in reverse order, would be the same as that of the non-reversed pairs. The difference that each individual student showed between his rating of the *iy* and *ah* presentations of the same consonant cluster on a single adjective pair scale, was the measure studied. For each of the five consonant clusters with

each of the 15 adjective pairs, a t-test for the significance level of the 48 differences between the *iy* and the *ah* presentation was performed. Section B of the handout indicates the mean value for each stimulus with each adjective pair, the line between means indicates that the difference between them is *not* significant at the .01 level.

To identify those sequences of phonemes that coincide with morphemes we start by comparing utterances and trying to match differences in phonemic form with differences in meaning. Partial similarity in both phonemic form and meaning usually requires a morphemic cut in one or both of the forms compared. For example, we can compare the words *helper* and *helping*. As native speakers we know that these two words are not grammatically interchangeable. We can assign the difference in meaning between the two words to the observed differences in the sequences *-er* and *-ing*. Without necessarily consulting a native speaker, we assign whatever presumed similarity in meaning these words share to the observed similarity in the sequence making *help-*. If by repeating this operation, these three elements prove to be not further divisable without complicating the emerging grammatical statement, as happens to be the case, we have thus identified three morphemes: *help-*, *-er*, and *-ing*. It is important to note that in this analysis all formal residues are accounted for.

This technique of segmentation was applied to the results. Since without considering meaning a given consonant cluster is phonemically equivalent to itself, that is, *gl* equals *gl* regardless of the syllabic attached, a significant difference in meaning of stimuli containing identical consonant clusters and different syllabics can be attributed to congruent differences in the syllabics. Where the meaning of stimuli with identical consonant clusters and different syllabics is not significantly different, this meaning is attributed to being a function of the consonant cluster. It is apparent that this technique of segmentation agrees closely with that of morphemic analysis. The only important operational difference is that the instrumentation employed to screen the informants' responses is more elaborate than that normally needed or used for typical linguistic analysis. One crucial difference, however, should be noted: going beyond the closed corpus of this study, which was designed to maximize the concentration of the elements discussed, to include all of normal English, would result in a large number of formal residues that would probably remain unaccounted for; for example, the *-isten* of *glisten*.

The next step was to apply glosses to the consonant clusters to which a connotative meaning could be attributed. For these consonant clusters the total mean value with both syllabics was found for each adjective pair scale, and a label was attached to this value. Mean values up to 3.49, which is the middle of the seven point scale, receiv ed the adjective on the left of the list, those greater than 3.49 received the adjective on the right of the list. These adjectives were then modified by "somewhat," for mean values between 2.5 and 4.49, and "quite" for values less than 2.5 and greater than 4.49. For example: the difference between *spiy* and *spah* on the good-bad scale is not significant, and a connotative meaning is attributed to the consonant cluster *sp-* on this scale. The total mean of judgments of both *spiy* and *spah* on the good-bad scale is 3.95. Since 3.95 is greater than 3.49 the gloss for the connotative meaning of *sp-* on this scale is "bad." Furthermore, since 3.95 is between 2.5 and 4.49 this adjective is modified by "somewhat." Following this procedure glosses were assigned to consonant clusters, and these are listed in section C of the handout. The modification "quite" is underlined because it is of interest to note that the original impression that *gl-*, *fl-*, and *sm-* show marked properties of connotative meaning and that *sp* and *st* are weaker in this respect was supported to the extent that not one of the adjective glosses for *sp* and *st* is modified by "quite."

As was indicated in the introductory remarks, students of language have acknowledged, in one way or another, the fact that phonemes or sequences of phonemes of less than morpheme status may carry a meaning. Previous reports have usually classified this observation under the heading of phonetic symbolism or synesthesia. Householder, in examining the problem of sound and meaning in 1946, proposed a unit, to be called "phonestheme," defined as: "a phoneme or cluster of phonemes shared by a group of words which also have in common some element of meaning or function, though the words may be etymologically unrelated."

The results of this study confirm the fact that such a phenomenon exists, but the method of screening informants' responses, and the technique of segmentation used in this study, suggest a different label and formal definition for two reasons. First, synesthesia, that is the production of a sensation in one modality by a stimulus applied to another modality is not the same order of meaning that is usually associated by linguists with morphemes. Second, the results indicate that a definition of the unit derived in this study should make a statement of its status with respect to other relevant units,

as well as some statement of its lack of constant meaning; that is, although the unit can be shown, as a result of special testing procedures, to call forth a connotative meaning, this meaning may fail discernably to accompany some occurrences of the unit, contrary to the fashion in which morphemic meanings, to the extent that they may be discursively glossed, regularly appear in some sense with morphemes.

Given these considerations, it is proposed that units derived by the techniques used in this study are a class of psycholinguistic units, to be called *psycho-morphs*. The *psycho-morph* is defined as: a non-morphemic unit of one or more phonemes for which a connotative meaning can be established, but, this connotative meaning may not accompany all occurrences of the unit.

A

1.	good	bad	9.	heavy	light
2.	clean	dirty	10.	bright	dark
3.	fresh	stale	11.	active	passive
4.	pleasant	unpleasant	12.	tense	relaxed
5.	beautiful	ugly	13.	hot	cold
6.	strong	weak	14.	fast	slow
7.	large	small	15.	solid	liquid
8.	loud	soft			

B

		gliy	*glah*	*spiy*	*spah*	*fliy*	*flah*	*smiy*	*smah*	*stiy*	*stah*
1.	good-bad	2.75	4.79	3.69	4.21	3.98	4.40	4.46	4.63	3.79	4.46
2.	clean-dirty	3.04	5.40	3.75	4.67	4.44	4.79	5.27	5.23	4.42	4.25
3.	fresh-stale	3.40	5.04	3.88	5.27	3.40	4.79	4.19	4.81	3.65	5.10
4.	pleasant-unpleasant	2.85	5.69	3.77	4.35	4.17	4.60	4.81	4.40	4.36	4.53
5.	beautiful-ugly	2.90	4.90	3.63	4.50	4.38	4.46	5.27	5.00	3.75	4.21
6.	strong-weak	3.77	4.35	3.10	3.65	4.33	4.81	4.23	4.77	3.10	3.77
7.	large-small	4.81	2.66	4.29	4.00	5.17	3.85	5.23	4.22	3.75	4.17
8.	loud-soft	3.23	3.19	2.48	4.46	3.42	4.19	3.25	5.10	2.75	4.08
9.	heavy-light	5.06	2.83	4.83	3.17	5.33	4.02	3.85	3.27	4.23	3.36
10.	bright-dark	2.04	5.04	3.13	4.52	3.10	4.77	3.46	4.83	3.81	3.94
11.	active-passive	2.67	5.31	2.67	4.33	2.35	4.71	3.60	4.85	3.19	4.88
12.	tense-relaxed	4.21	5.06	2.42	3.85	3.10	4.98	3.13	5.31	3.08	4.27
13.	hot-cold	4.71	3.98	3.69	3.77	4.29	4.02	4.69	3.38	3.69	3.75
14.	fast-slow	3.56	5.15	2.42	4.58	2.08	3.60	3.94	5.62	3.02	4.96
15.	solid-liquid	3.90	4.42	3.81	3.65	4.23	4.31	4.08	4.02	3.25	3.31

C

gl—: somewhat weak, somewhat loud, *quite* relaxed, somewhat cold, somewhat liquid.

sp—: somewhat bad, somewhat unpleasant, somewhat ugly, somewhat strong, somewhat small, somewhat cold, somewhat liquid.

fl—: somewhat bad, *quite* dirty, somewhat unpleasant, somewhat ugly, *quite* weak somewhat soft, somewhat cold, somewhat liquid.

sm—: *quite* bad, *quite* dirty, *quite* stale, *quite* unpleasant, *quite* ugly, *quite* weak, *quite* small somewhat light, somewhat liquid.

st—: somewhat bad, somewhat dirty, somewhat unpleasant, somewhat ugly, somewhat strong, somewhat small, somewhat light somewhat dark, somewhat cold, somewhat solid.

PANEL III

LEXICOGRAPHY

THE SEMANTIC PATTERNING OF WORDS

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The lexicographer conveys typical meanings by translation, paraphrase or description; he illustrates typical constructions in which the expression occurs; he illustrates typical lexical contexts. He hopes that such treatment of words and phrases will be meaningful to the reader. Judging from the fact that dictionaries are much in demand and relied upon by scholars, the lexicographer feels that he is doing a useful job and that he achieves his purpose to a considerable extent.

Looking beyond his immediate objective, the lexicographer is apt to ask himself all sorts of questions. He may ask to what extent the 'typical meanings' that he points out are *inherent* in the words of the language he deals with, and to what extent he *introduces* semantic distinctions for the sake of speakers of another language, i.e., of the language of the reader.

To illustrate. The ME adverb *faste* occurs in context with such verbs as *stand, hold, join; run, attack, defend; start, stop; rain, blow; look, learn; sleep; love, fear.* When I gloss such ME verb phrases in MnE by 'stand fast', 'join firmly', 'attack vigorously', 'stop suddenly', 'rain hard', 'look sharply', 'sleep soundly', 'love dearly', etc., do I identify inherently different meanings of ME *faste*, or do I attribute MnE semantic distinctions to it? Should I say that ME *faste* has only ONE meaning, a vague SEMEME, that could be suggested by the MnE expression *intensely?* Should I say that it has different meanings when joined with verbs of rest, verbs of motion, verbs of mental activity, and verbs of emotion, assuming that rest, motion, mental processes, and emotional experiences are 'categories of thought' reflecting different 'spheres of reality'?

Let us look at another example. ME *daunten* (whence MnE *daunt*) occurs in a wide range of lexical contexts in which MnE requires a variety of verbs. We *intimidate* or *daunt* a person, *tame* a horse, *train* a dog, *defeat* an enemy, *conquer* a country, *pacify* a child, *flatter* a woman, *control* an impulse, *restrain* our tongue, *refine*

our behavior. In all such contexts ME has, or can have, the verb *daunten.*

Does that mean that ME *daunter* has as many *referential* meanings as the number of suitable MnE translations would suggest? Shall we go to the other extreme and say that ME *daunten* has only ONE meaning (a SEMEME), which could be paraphrased by such a MnT expression as *exert influence in such a way as to control (something)*? Shall we say that the *referential* meaning attaches to the verb phrase as a whole, and that we cannot assign discrete meanings to the verb and to its object? If the latter, should the lexicographer bother with words? Should he not rather deal with phrases or with whole sentences? The answer would seem to be that ME *daunten* actually has a variety of *referential* meanings which the lexicographer manages to convey to the reader by giving suitable lexical equivalents and by pointing out typical contexts. 'Intimidating' a person, 'flattering' a woman, 'restraining' one's impulses, 'defeating' an enemy, etc., are different observable *segments of reality* in any society, though these actions may be variously regarded in different societies. But where shall we draw the line between referential meanings inherent in the source language and meanings pointed out by the lexicographer for the sake of speakers of another language?

Can we shed some light on such vexing problems by investigating the parrellel semantic patterning of antonyms, synonyms, and paronyms, or the parallel semantic behavior of word classes? Since such parallelisms *do* exist, it is not unreasonable to expect that they may reflect either culture-bound habits of analyzing reality for purposes of communication or effects of the grammatical structure of the language.

Parallel semantic patterning is perhaps most striking in antonyms.

Thus in ME both *bright* and *derk* are applied
to a source of light, to color, and to the weather:
'bright' vs. 'dark';
to vision: 'keen' vs. 'poor';
to utterances: 'clear' vs. 'obscure';
to behavior: 'virtuous' vs. 'wicked'.

Their application diverges in that *bright,* but not *derk,* refers also to the appearance of persons: 'fair' lady, 'handsome' fellow; and to sound: 'clear, resonant'. On the other hand, *derk,* but not *bright,*

is applied to mentality or mood: 'ignorant', 'despondent'; and to moral characteristics: 'malignant'.

It should be noted that the divergences in the range of applications of ME *bright* and *derk* may be apparent rather than real because the ME corpus of writings, though large, is limited.

Parallel patterning is also common in synonyms. Thus both ME *care* (from OE) and *distresse* (from OF) are applied to an emotional experience and to a situation that induces the emotion. Only *care* means also 'pain' and 'responsibility'; and only *distresse* means also 'coercion' and (in *law*) 'right of seizure'.

Paronyms (i.e. coordinated terms, terms belonging to the same sphere of reality) are apt to exhibit parallel patterning, as *eye* and *ear*, both of which designate (a) a sense organ as an anatomical entity; (b) the function of the organ (perception); (c) a mental operation: *eye* 'insight, opinion' (*have an eye for sth.*); *ear* 'attention' (*lend an ear*); (d) an object similar in shape or position to the organ: *eye* 'bud' (of a plant), 'hole' (in an object); *ear* 'protruding handle' (of a pot). The two terms have also a variety of similar figurative uses. Only *eye* is used in the sense of 'expressing or arousing an emotion or attitude', as in the expressions *lecherous eyes, kind eyes, evil eye.*

Such examples could be multiplied almost indefinitely for any language. The few that time permits me to present are indicative of what one finds in ME:

(1) A word can denote a complex reality, or any one of its several aspects, as *eye* in the senses 'organ of sight, an anatomical structure, vision', or *distresse* in the senses 'a threatening situation, an emotional experience induced by the situation, a situation with the emotional response to it'. The intended meaning is conveyed by the lexical context or the grammatical construction, but may remain ambiguous.

(2) A word denoting something perceived with the senses can be applied to mental or moral qualities, experiences, or activities, as when *bright* and *derk* refer both to light, color, and vision and to certain types of thought or behavior.

(3) A word can be transferred to something having a superficial or imagined similarity to its original referent, as when *eye* is applied to a bud or a hole, or *ear* to a projection on a vessel.

Such observations are by no means novel. They are the stock in trade of semanticists from Bréal, Paul, Wundt, and Nyrop to Kronasser and Ullmann. What I would suggest is that this whole matter be systematically investigated in a number of different languages by analyzing the semantic range of synonyms, antonyms, and paronyms with a view to establishing the extent of parallel semantic patterning. I suspect that marked differences between languages may turn up and give us new insight into the 'thought world' or 'world view' of different peoples.

I conclude by merely hinting at the fact that word classes, such as nouns or subclasses of nouns, often exhibit similar semantic patterning. Thus action nouns frequently denote both an activity or process and the result or product of the activity or process. For instance, ME *generacioun* means 'propagation of the species, divine creation, development (of an embroyo, a plant), generation (of heat) as well as 'progeny, ancestral line or pedigree, a breed (of dogs)'. In parallel fashion, ME *feigninge* denotes the 'act of inventing (sth.), composing a story)' and 'a thing invented or composed: an invention, a story, a legal fiction, a supposition, a false statement'.

One can perhaps argue that a process or activity and its result or product are complementary aspects of a complex reality and that action nouns come to be applied to the result or product of the process or action for that reason. But it seems equally possible that this type of patterning is somehow connected with the structural fact that in English verbs have, or may have, objects.

Thus I end, as I started, by posing a question. I hope that someone will have the skill and he persistence to follow up my implied suggestions.

SUBJECT ORIENTATION WITHIN THE DEFINITION

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Subject orientation is a general linguistic awareness of what a definition is about. The maker of a monolingual dictionary assumes not only that its user understands the language in which it is written but that the user brings to a definition some inkling of what it means. At the least the user is aware, whether he realizes it or not, that an unfamiliar word is being explained in patterns of word-elements like those he is familiar with. This awareness can be augmented and constructively effected within a definition in several ways.

The multifarious agents effecting subject orientation are incomprehensible in their totality and undistinguishable as discrete forces. They vary with each person who utters or writes a word, with each person who hears or sees it, and with each verbal context and human event associated with it. The dictionary focuses one-by-one alphabetically on an abstraction magnified into the formidable status of a definiendum and expediently further extracts certain limited notions about its denotations. Human beings communicating by means of language focus step-by-step on a phenomenon—idea, thought, morpheme—verbalized but unanalyzed and never totally intelligible. The distance between these two kinds of focusing is a measure of the definer's task. The gap between the results of his analysis and a linguistic experience that calls for consulting a dictionary must be narrowed insofar as possible by methods and devices that can effect subject orientation. It follows that subject orientation is a highly relative matter open to all sorts of doubt and dispute.

A word is best oriented integrally within the essential wording of its definition, that is, either in the genus or the differentiae of an analytical definition. Ideally the genus-designation should be by itself understandable and should illuminate the subject area:

> *kodurite*: a rock. . .
> *patamar*:a ship. . .
> *kowhai*: a shrub. . .
> *rubbers*: a disease. . .

This orientation is no less clear (nor is the subject necessarily any

more clearly oriented) when an adjective or attributive noun limits the genus-word, whether or not its significance is immediately understandable:

amaranth: a garden plant. . .
krait: a venomous elapine snake. . .
pectolite: a whitish or grayish monoclinic mineral. . .
diphtheria: an acute febrile infectious and contagious disease. . .

Orientation may be effected by an essential modifier of the genus (the orienting terms are underlined):

Pinnotheres: a genus of small *crabs*. . .
Acocanthera: a genus of six species of African *shrubs*. . .
dietotherapy: a branch of *dietetics*. . .
panpolism: equality of *civic rights*
cable stitch: a *knitting* stitch. . .
birational: of or relating to an *algebraic* transformation. . .
glide: a *fencing* attack in which the forte of the weapon. . .

Whether a genus-word or a modifier is understandable and therefore adequately orienting involves a highly subjective decision. In order, however, that there may be a standard that definers can follow routinely, the vocabulary of an elementary school dictionary is arbitrarily considered understandable for orientation. On this basis words like *brandy, fable, fabric, fossil, mammal, rodent, thrush, vertebrate,* and *vicar* are understandable nouns and the following are arbitrarily considered not understandable: *arachnid, carbide, cetacean, digit, eponym, isopod, necrosis, silicate, syndrome,* and *univalve.* Likewise the adjectives *amphibious, contagious, herbivorous, nocturnal,* and *vertebrate* have understandable orienting force as modifiers and the following have no recognizable orienting force: *calciferous, elapine, fossiliferous, marsupial, ovulate, venous,* and *vermiculate.* This does not mean that an arbitrarily nonunderstandable word is unusable; it simply means that it is probably contributing little or nothing toward orientation.

A second device for effecting internal subject orientation is a parenthetical adjunct which incorporates matter that is nonessential syntactically but may be very helpful semantically. One of the simplest types is generic exemplification:

gallery: a large or important collection (as of paintings) . . .
cabin: a temporary shelter (as a soldier's tent) of slight ma-

terials. . .

bolt: something (as an attack, effort, argument) likened to a missile shaft. . .

speech area: an area where a language (as French), a dialect (as Scottish), or a linguistic feature (as German *t-* instead of *z-*) prevails.

A more restricted use for the parenthetical adjunct is showing a typical object (or sometimes two or three) of a transitive verb that takes any of several objects of a type:

gallant: to handle (as a fan) in a modish manner.

pouch: to cause (as a part of a dress) to droop like a pouch.

minister: to dispense or perform (as a sacrament or rite) with ceremony.

officiate: to celebrate (as a rite or service) formally.

deny: to turn down (one who asks).

No doubt such parentheses interrupt the flow of constituent elements, but dictionary definitions unavoidably have some abnormal conventions, for clarity is often more important than normal word order. Even the use of *as* for *such as* is a convention one has to get used to.

In similar function, a parenthetical adjunct can be the only object of a transitive verb unless the object is cognately implicit in the verb:

set: to put (a fowl) on eggs. . .

plug: to close (a rivet) by hammering. . .

dose: to proportion (a medicine) properly.

partake: to share in (food or drink).

pipe: to transmit (a radio or television program) by wire. . .

draw: to play (a cricket ball) with an inclined bat. . .

An only object is likely to be more semantically restricting than a typical object, but sometimes a specific or concrete typical object will be more effective and safer than the class only object; for example:

scrape: to bow (as a violin [typical object]) with a rough unmusical tone.

: to bow (a stringed instrument [only object]) with a rough unmusical tone.

set: *to dispose* (as an insect [typical object]) for preservation *and examination*

: to dispose (a specimen [only object]) for preservation *and examination*

For *scrape* the definer has a choice; but for *set* the only object is so unsatisfactory that the definer must either prefer the typical object or revise completely. The necessity for sometimes making a choice should dispel any doubt that may have arisen about the status of such terms in parentheses: they are generic names of meaning-classes. A definition of *run* reading "to spread or blend together (as of colors)" allows a substitution; the realm of typicality includes not only the word *colors* but also any other word meaning "colors," as *pigments* or *paints,* and any color combinations as *red and burnt umber.* Sometimes one must use a relatively uncommon or literary word for lack of a better. In "to put (a fowl) on eggs" *fowl* is the one available word; *bird* is too broad, *hen* is likely to be interpreted too narrowly, *duck* is too narrow, and enumeration would be long and incomplete.

Since many transitive verbs, especially the common operators, are capable of taking a diversity of objects, often no one object can be accepted as typical. This diversity should not be recognized by unqualified indefinite pronoun; in

> *make*: to produce, frame, or fashion (something) by operating upon physical materials

something should be deleted. Likewise *someone* or *one* or *some specified state* should be avoided as an only object if possible as in:

> *direct*: to give (one) information concerning a route.
> *make*: to cause (someone) to go or come to (some specified state).

As this last example reveals, avoidance of such indefinite objects will often require more attention than mere deletion: what's left here ("to cause to go or come to") is hardly admissible by any standards. Whereas objection to unqualified and insignificant indefiniteness is always in order as a principle, sometimes injection of nominal content can make the indefiniteness seem less objectionable:

> *give*: to make, perform, or execute (some bodily motion)
> *solve*: to clear up (what is obscure)

A special kind of both only object and typical object is the reflexive pronoun. Whenever this object is one of several non-reflexive objects, it should be treated like any other object of a transitive verb: the meaning of the verb remains the same whether we say "she dresses herself with care" or "she dresses her child with care;" "I hurt him" or "I hurt myself." In such cases it is not necessary to

insert the pronoun object in the definition any more than any other possible object; in a definition of *bathe* reading "to immerse (oneself) in water for hygienic purposes or for pleasure," the parenthetical *oneself* should be omitted. Some transitive verbs in some senses now usually take a reflexive pronoun as object but not always. This usage produces a typical object:

> *bestir*: *to put or rouse* (as oneself) into brisk or vigorous action.
> *compose*: to dispose or adjust (as oneself) to calmness. . .

But usually, and always for the few verbs that are almost never used today with any object other than the reflexive pronoun, the essential reflexive pronoun is an only object and as such is to be inserted in a definition as a parenthetical adjunct. More accurately, perhaps, the only object is the fixed element *-self* in a set of reflexive pronouns (*herself, themselves*). Whichever form occurs in an utterance is an accident of context; *oneself* can stand both for oneself and for the set, which in usage as well as in traditional dictionary style it often does. However, *itself*, or any other member of the set, can be used when semantically appropriate. Examples of reflexive pronoun as only object:

> *pride*: to rate (oneself) highly
> *preen*: to trim, dress, or smooth (oneself) up
> *betake*: to convey (oneself) to
> *present*: to betake (oneself) into the presence of

Another function of the parenthetical adjunct is to show a typical subject of an intransitive verb:

> *cling*: to adhere closely (as of a wet garment)
> *blink*: to turn slightly sour (as of beer or milk)
> *run*: to spread or blend together (as of colors)

The phrase *as of* helps to avoid mistaking a typical subject for a typical object of complementary transitive use:

> *strike*: to sound (as of a clock [typical subject of an intransitive]) by percussion
> : to play (as a piano [only object of a transitive]) on the keys for the v. i. read "*as* one might say 'it strikes' in speaking *of* a clock" and for the v. t. read "*as* one might say he strikes the piano keys")

Several examples of an adverbial phrase functioning as a dif-

ferentiating essential modifier of the genus verb have already been shown outside parentheses; for example, *gain*: "to get by a normal exercise of function." But a typical adverb is nonessential and should be a parenthetical adjunct:

> *locates*: to define (as by a survey) the location or limits of
> *bawl*: to cry (as in calling) with vehemence
> *bawl*: to cry (as from pain or vexation) loudly

Every example of the parenthetical adjunct so far has been connected directly with the genus as object, subject, or modifier. Its usefulness is not, of course, necessarily so limited. It can be an adjunct of various elements of the differentiae.

Nongeneric exemplification:

> *calendar*: to enter or write in a calendar (as of saints)
> *wad*: to stuff with a soft substance (as cotton)

Only object of a nongeneric verb:

> *basis*: that which supports or maintains (something not material)

Typical adverb of a nongeneric verb:

> *man*: to station men to take hold of and exert strength upon (as by pulling)
> *pouch*: a sac esp. for carrying the young (as on the abdomen of a marsupial) or food (as in the cheeks of a rodent)
> *tumble*: to whirl in a tumbler or tumbling barrel (as for polishing metal, softening leather goods, or drying clothes)
> *set*: to put a smooth edge on (a cutting tool)
> *take*: to put an end to (life)
> *break*: to soften the fibers of (a skin)
> *work*: to practice trickery, cajolery, or some devious procedure upon (a person)
> *express*: to make known the opinions or feelings of (oneself)
> *proclaim*: to issue a proclamation outlawing (a person), prohibiting (a meeting), or quarantining (a district)

A third device for effecting internal subject orientation is a verbal illustration. A verbal illustration is an anonymous phrase or clause, less often a sentence, editorially devised to contain the definiendum (or an inflected form of it) and to illustrate a characteristic contextual use of it in a particular sense:

sake: the good, advantage, or well-being of a person or group <die for the *sake* of one's country>

contest: to strive earnestly to gain or hold <the soldiers *contested* every inch of ground>

vicarious: enjoyed by one person through sympathetic participation in the experience of another <*vicarious* pleasure>

Aside from the visual difference between curves and angle brackets, a verbal illustration differs from a parenthetical adjunct by containing the definiendum and by having contextual matter irrelevant to the definition.

A verbal illustration should simulate a genuine passage from verbalized communication. Imagining the communication, snatching from it a phrase that will stand up semantically before the context drops back into the deep well of cerebration, and fixing this residual essence in a definition is the most exacting test that the defining process can impose. The basic principles of defining technique can be learned by diligent application, but the devising of good verbal illustrations depends upon a talent that cannot be appreciably developed, upon Sprachgefühl at its nicest. As in most other artistic expression, the manifest form of this creative act must in perfection seem simple, effortless, and inevitable. A successful definer must accept the challenge, for good defining often turns on the verbal illustration.

A verbal illustration should be current, except when currency is inappropriate (as for historical allusions or atmosphere). The way in which locutions reveal their age is subtle. Trained as most of us are to converse familiarly with writers of the past, we sometimes accept too readily the idiom of a former age. A mid-20th-century dictionary should give evidence of having been written by editors who live in the 20th century; we should not go on saying for the verb *chase* <*chase* the boar>; for the adjective *limp* <a *limp* cravat>; for the verb *meet* <*meet* carriages in the street>, or for the verb *trail* <her skirts *trail*>. Anybody who could devise out of the blue for the verb *gall* <the troops were *galled* by the shot of the enemy> must have died at an old age many decades ago. Likewise with <pirates *flaunted* their sails outside the harbor entrance> for the verb *flaunt*. The average dictionary user may sometimes be more aware (unconsciously) of quaint echoes from the past than the lexi-

cographer. Anyway he will be the ultimate judge.

A verbal illustration, like a clarifying simile, should go from the remote and unfamiliar and difficult to the near and familiar and simple. The definiendum by the very nature of the defining process is technically the unfamiliar. The definiens may have to be difficult, but the verbal illustration should not involve anything not readily acceptable once it is called to attention. By this reasoning the following are all bad:

massive . . . <a *massive* dose of stilbestrol>
rag . . . <*rag Annie Laurie*>
cadaverous . . . <a *cadaverous* smell>
superior . . . <the *superior* limb of the sun>
shrink . . . <*shrink* one's blood>
holdover . . . <with peach yellows every case is a *holdover*>
feasible . . . <find Nice *feasible* for an invalid>

The last one touches a geographic blind spot that guarantees mispronunciation and confusion: who in the 20th-century United States finds Nice feasible for an invalid?

A verbal illustration should be as easy and natural as possible and should seem to have come from living speech. This important test of fidelity or authenticity does not refer necessarily to the reader's own speech but to a usage that he will recognize as plausible by someone he knows, knows about, or can imagine, and to a point of view that he can readily grasp. A verbal illustration devised for the verb *answer* <this knife must *answer* if no one has a sharper> is an artificial monstrosity. The schoolbook unnaturalness found in "the pen of my aunt" is outdone by a verbal illustration once set down for the verb *calve*: <the cow *calved* a heifer>; <the jury or the court *acquitted* the prisoner> combines two plausible statements: "the jury acquitted the prisoner" and "the court acquitted the prisoner," but the combination itself is improbable; <a *capital* error or mistake> is insipid, for no one is likely ever to use such a phrase. Nor should terms related only remotely be joined by ellipsis: <a person *susceptible* to infection, criticism, or women>, <a *desolate* isle, wilderness, house>, <unable to *trace* a lost letter or one's relatives>, <an *elephantine* tread, task, jest>, <the broad *sweep* of a meadow, epidemic, or decree> all are unnatural.

A verbal illustration should have typicality. One could illustrate either *pirate* or *crochet* by <the pirate was *crocheting a* doily>,

which is direct, brief, and not impossible, but so untypical of the supposed activities of pirates that to use it would be to mislead the naive and to amuse the sophisticated; <a harbor *infested* with fishing craft> may reflect the flavor of *infest,* but it is unsuitable for a verbal illustration because to understand it requires a restricted point of view: it is typical only of a harbor pilot trying to take a large ship into its dock. Atypical points of view appear in both <the wings of startled bats *flapped* in his face> and <a direct blow from the whale's tail>. Striking novelty is not a desideration; often a cliché or a locus classicus will do the job better.

A verbal illustration should not be incongruous. Anything that might strike one as ludicrous or suggestive should be avoided. Some people are more easily struck by such possibilities than others, but the definer should anticipate the most unlikely and perverse interpretation. A nimble and ready perception (and appreciation, too) of double meanings is a valuable, an almost indispensable, quality in a definer, but its editorial usefulness is more often repressive and preventive than creative. By it he can easily keep the verbal illustration pure and above reproach. He should give no one a handle for poking fun at any definition. The verbal illustration should not invite challenge even by the hypercritical on the basis of fact or by the contentious on the basis of pointless moralistic tone: <black cows *give* black milk> perfectly illustrates one sense of *give,* but, being nonsense, it is challengeable; so also <white cows *give* white milk> would be challengeable because of its implication; <next year is an *election* year> may be untrue; <an easy disposition is an *enemy* to success> is a snappy coypbook maxim and <*sin* away one's happiness> is semantic foolishness inviting ridicule. Gratuitous lauds and sneers are as out of place as gratuitous moralizing. No individual or organization should be able to flaunt a verbal illustration or take offense at its implications; even <*shady* speculators> can be misinterpreted.

A verbal illustration should avoid (except for good reason) incidental unrelated use of place names; <this bus *runs* to Peoria> should be changed to <this bus *runs* to the next town> and <a ship *destined* for London> should read <*destined* for southern ports>; <*sack* Rome> refers weakly to a somewhat vague historical event. More than one apology has been necessary for an illustration at *swelter* <he is *sweltering* in Florida while we are freezing up here> —apologies which would not be necessary if use of *Florida* had been interdicted. References to Ruritania, Shangri-La, Foggy Bottom, or

the seacoast of Bohemia are even more objectionable. This does not imply an objection to use of a proper name whenever lexically helpful, as at *common* <Boston *Common*>, at *fall* <the *falls* of Niagara>, at *sierra* <the *Sierra* Nevada>. Likewise references to people as <Abraham about to *sacrifice* Isaac> and <the novels of H. G. Wells are *journalistic*> are objectionable. Paradoxically the antecedentless pronoun impersonalizes a verbal illustration; *he* and *she* should always be preferred to real people, and to pusillanimous *John* and *Mary*.

Nearly all the observations so far have been supported by how-not-to-do-it examples. In this paragraph a few of the functions of the verbal illustration will be recapitulated and supported by acceptable examples that perform positive service. These are not new functions essentially different, and they are not mutually exclusive. They merely reiterate in different ways that the chief service of a verbal illustration is what it contributes to the understanding of meaning. It is itself a recognized method of defining, sometimes called implicative or adumbrative or contextual defining. Some of these functions, then, are:

—to indicate a familiar and common application of an excessively broad or unavoidably preplexing definition for a general word; as at *place*: a proper or suitable spot considering all things <a time and *place* for everything> <this is no *place* for children>; at *plane*: a level or stage of development or existence <live on a low *plane*> <lofty *plane* of discussion>; and at *plant*: a contrived decoy or trap <a *plant* to catch speeders>

—to cover implicitly an application not made specific in the definition; *inside* defined as "the inner side or surface" does not explicitly cover uses like the inside of a fabric, the inside of a leaf, the inside of a board, the inside of a spoon, the inside of a leg, any of which would make a good verbal illustration

—to particularize without excluding; as at *articular*: of or relating to a joint <an *articular* disease>; this illustration comes to the aid of what could be an ambiguous definition (but actually is defensible) by directing attention to a basic sense of *joint*, the most probable sense, without excluding a possible wider application

—to indicate whether concrete or immaterial; as at *place* in the sense of "repose" <*place* confidence in a friend>; <*pressure*

of the hand> and <the *pressure* of poverty>; <*seize* one's arm> and <*seize* an idea>

—to indicate personal and nonpersonal applications; at *safety*: of or related to safeguarding the public <*safety* measures> <*safety* engineers>; at *saccharine*: <a *saccharine* smile> <*saccharine* poetry>; at *sad*: characterized by or associated with sorrow <the *sad* light of the moon>, thus illustrating a nonpersonal extension of a word commonly personal; sometimes such an extension should be the second of a pair, the first being transitional, as at *gallant*: noble in bearing or spirit <a *gallant* officer> <a *gallant* charge>

—to help offset negative phraseology with vague boundaries; as at *plain*: lacking in beauty <a *plain* woman> and not intricate <a *plain* pattern>; at *naked*: lacking some covering, decoration, or appurtenance customary or natural so as to appear bare <*naked* trees> <*naked* rooms>

—to offset collectively the dry effect of an entire book of abstract analyses of words as words. The principal lifeline between abstraction and living speech is the verbal illustration. it is a brief bit of information about the distribution of the definiendum.

A special form of verbal illustration has been left for special brief consideration. That is the illustrative quotation, which is one of Dr. Johnson's important contributions to lexicography and the essence of the OED. It differs from the verbal illustration at two points: instead of being devised by the definer and presented anonymously, it is quoted from an acknowledged source; instead of illustrating in context a characteristic use, it may illustrate in context a linguistically appropriate use. Although <*chop* off his hand> can hardly be considered characteristic usage, <*chop* off your hand, and send it to the king—Shak.> is at the very core of meaning of the basic sense of *chop* and is quite quotable. More often than not, however, the chosen quotation will illustrate a characteristic contextual use. Nearly every principle applicable to the verbal illustration is applicable to the illustrative quotation.

There is a lot of detail about using quotations within a definition which can be passed over for a few principles of more general interest. Since the primary reason for including an illustrative quotation is to clarify meaning, it must, therefore, not be gratuitously ambig-

uous, obscure, or difficult. Irrelevant archaisms, inversions, and sonorous but meaningless passages should be avoided as barriers to understanding. By the demands of the context the word being illustrated should be clear in meaning and perceptibly appropriate. Any quotation which is not informatively clear to the rank and file of dictionary users is a waste of space, or worse, a positive deteriment. For example:

<choicest *cates* and the flagon's best spilth—Browning>
<pale as a *forpined* ghost—Chaucer>
<the father banished virtue shall *restore*—Dryden>
<with aspect *open*, shall erect his head—Pope>
<give them a *camisado* in the night season—Holinshed>
<said the grim *Feature* (of my thought aware)—Shelley>

Quotations should not be purely decorative or highly metaphorical. The hard truth is that literary flavor in dictionary quotations represents a luxury of a bygone age. For example:

<the cataracts blow their *trumpets* from the steep—
Wordsworth>
<the secret snake that *shoots* a sting—Dryden>
<let the *candied* tongue lick absurd pomp—Shak.>
<I will encounter darkness as a bridge
And *hug* it in mine arms—Shak.>
<two women faster *welded* in one love—Tennyson>
<death, keeping his circuit by the *slicing* edge—Marlowe>
<whitest honey in fairy gardens *culled*—Tennyson>

Invariably an illustrative quotation should not be ironic or open even to the suspicion of irony . "Your means are very slender and your *waste* is great" and all Shakespeare's other magnificent puns, such as in Hamlet's last words ("the rest is silence"), must unfortunately be scrupulously avoided.

Since the illustrative quotation is to be chosen primarily for its contribution to an understanding of meaning, not for its decorativeness and not for lending authority to a definition, it follows that it doesn't much matter who is quoted. Obviously if an author's name itself carries some kind of helpful and congruous message—rings a bell in the reader's mind—it contributes just that much more and adds as an extra the pleasure of recognition. But any prestige a name lends must be considered accidental. There is no correlation between prestige and popularity. The question of the public's sup-

posed familiarity or unfamiliarity with any given author is not at issue: the quotation is illustrating a word, not citing an author. Therefore a nondescript and unidentified name on a quotation need be no argument against using it; nor should any name be presumptuously considered wanting in scholarly repute: Mickey Spillane, Edgar Guest, L. Hill, G. A. Henty, Elinor Glyn, Billy Graham, Bill Cunningham, Polly Adler, N. V. Peale, Fred Allen, Gypsy R. Lee, Walter Winchell, Al Capp, Dale Carnegie—they all use standard English, some of them rather profitably, and are often quite quotable. Almost anyone just named could be in the right circumstances a better source than Charles Lamb, Thomas Gray, or Sir Thomas Browne. There should be no hesitation about putting out Milton or Pope and putting in Dwight Eisenhower.

Subject orientation as now defined concerns meaning or matter. It would be quite misleading to stop here without saying that the lexicographer must deal with still another important kind of orientation. That is usage orientation. Broadly, it is concerned with manner, the manner in which a definiendum is formed, pronounced, and related in time, place, and syntax to other elements of the language. Some of this is taken care of by the accepted pattern of dictionary entry (spelling, pronunciation, functional label, etymology, historical order). In a narrower sense usage orientation is effected by that part of an entry which identifies the regional, temporal, or stylistic character of the context where the definiendum is ordinarily to be found or which comments in any way on its syntactical, structural, or relational characteristics. That is matter for an even longer paper.

SPECIAL VOCABULARIES IN THAI

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One of the most interesting of the recent trends in linguistics is the search for features of semantic structure in the lexicons of languages. It is the purpose of this paper to point out in the Thai language an exceedingly simple structural feature manifested in various segments of the vocabulary. This feature is the conventional substitutability on a one-to-one basis of special terms in certain contexts for particular items of the ordinary vocabulary.

Perhaps the most obvious of these special vocabularies is the special set of forms used in speaking of and to royal persons. It is well known that Thai and many other languages of South and Southeast Asia have such special royal terms. They are often described by tourists and even scholars as a special royal language. This is an exaggeration, perhaps encouraged by the tendency of speakers of the language to grumble about the alleged difficulty in mastering and controlling these special royal forms. The royal terms do not constitute a special language, nor even a special dialect. They consist simply of a limited list of special lexical items, usually single words but sometimes phrases, which are substituted for corresponding items in the common vocabulary when speaking to or about a royal person.

This royal vocabulary is called in Thai *raachaasàp*, literally "royal words." The list has been published frequently in school textbooks. Perhaps the most authoritative version of the list is that formerly issued in pamphlet form for use by students in the Royal Pages' School.[1] This list contains 92 terms for parts of the body, a couple of dozen kinship terms, 66 terms for animals and miscellaneous objects, and 73 terms for actions of various kinds. These categories occupy roughly half of the small volume. The remainder consists of an alphabetical finder-list according to the ordinary synonyms.

Analysis of such published lists of royal terms are misleading in that they suggest that the special royal vocabulary is more exten-

[1] Royal Pages' School, *Raachaasàp*. Bangkok (2nd edition), 1932. 52 pages. (In Thai.)

sive than it actually is. From our point of view the list is found to be padded with various polite and euphemistic synonyms for vulgar terms of ordinary speech, but these polite terms—comparable to "limb" for "leg" in English—do not actually belong to the special royal vocabulary. Additional confusion for the lexicographer's purposes is that many of the entries in the published lists are not separate items at all, but merely illustrative phrases.

The failure in the past to perceive the special characteristics of the royal terms and separate them out from such lists accounts for the confused and wasteful treatment given the royal vocabulary in existing dictionaries.

The key to the whole phenomenon is clearly the principle that certain special terms are conventional substitutes in situations involving royalty for ordinary terms of the common vocabulary. This becomes clear from the use of the special royal terms as substitutes for the corresponding ordinary terms not only in straightforward literal contexts but also in various idiomatic and metaphoric expressions; that is to say, wherever the ordinary term would occur in ordinary speech, the royal term is substituted for it if the situation involves royalty. It is as if the ordinary term were tabu in such a situation, but the term tabu is hardly applicable. For example one may use the ordinary term for "hand" in speaking to royalty, but only the special term in referring to the hand of a royal person, whether speaking to royalty or about royalty. Highly conventionalized euphemism would perhaps be a more accurate characterization than tabu.

These royal terms have been used in Thai at least from the time of the oldest records of the language, beginning with the celebrated Sukhothay inscription of 1292 A.D., and similar special sets of royal terms are found in the languages of the other Southeast Asian countries that derived their higher culture from India. In Thai some of the royal terms are native Thai words; many are loanwords from Cambodian; by far the greatest number is Indic.

No doubt in the days of the absolute monarchy they were one of many devices which served the function of augmenting royal power by marking with the utmost clarity the distinction between royalty and subjects. Other features of the traditional culture may be noted which appear to have had a similar function. Only royalty in the old days could possess certain types of gold objects. Only royalty could, and indeed was expected to, marry within the family, while

for commoners incest was as adversely regarded as among other peoples elsewhere.

Although it seems clear that in the past the special royal vocabulary served this function of emphasizing the distinction between royalty and commoner, there is nowadays an opposite tendency to play down this distinction, to encourage the view that royalty is human. The result is that many now regard the special royal vocabulary as an unfortunate and awkward interference. It is not uncommon for princes who participate in public affairs, as many do, to ask their friends not to use the special royal terms. More than one Thai monarch of the twentieth century has turned to English in conversation and correspondence with Thai friends and relatives to avoid the complications of the royal terms. [2]

Use of the royal terms in the future will no doubt decrease. Journalists and others still try to use them properly, but slips are viewed leniently. Another factor which will also work for a decrease is the simple fact that the number of royal persons, formerly very large as a result of the polygamous royal marriages, is rapidly dwindling now that their numbers are not being replenished by the twentieth-century monogamous kings.

To return to the lexicographical aspect of the royal vocabulary, it seems clear that lexicographers, both Thai and foreign, have made unnecessary work for themselves by failing to recognize that the correct treatment of these terms is simply to mark them as part of the royal vocabulary and then give the synonym from the ordinary vocabulary for which they substitute.

Traditional Thai culture was characterized by the high value placed on decorum and convention. In social manners, in official conduct, in artistic composition, and in many other aspects of life in the traditional social system, one is struck by the striving not for originality or for unique individual achievement, but rather for grace and elegance in manipulating strictly conventional forms. With this in mind, one is tempted to seek further in the Thai lexicon for more such highly conventional phenomena as that exhibited in the royal vocabulary described above.

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[2] One member of the royal family writes, "Members of the Chakri Family have often written to one another in English to avoid the elaborate language required for the different ranks even amongst relatives." Prince Chula Chakrabongse, *Lords of Life* (New York, 1960), p. 271.

A similar phenomenon is found in the forms used in speaking to or about Buddhist monks. These include a small number of special terms for "food," "to eat," "to sleep," etc., and here again it is clear that each special term substitutes automatically for a particular term of the ordinary vocabulary. Though the list of special terms for monks is much shorter than the list of special terms for royalty, the terms for monks have no doubt always had a much wider use, since most Thais seldom if ever have occasion to speak to royalty but virtually all Thais are in contact with Buddhist monks constantly throughout their lives.

Continuing our search, we find a similar lexical phenomenon in a particular segment of the literature, the large body of literary works dealing with the Panji romance, a story cycle of Javanese origin. Literary works on this theme include some of the major masterpieces of classical Thai literature, as well as many minor poems.[3] In all of these romantic tales dealing with Inaw, as the hero of the cycle is known in Thai, there occurs a special set of terms for "moon," "flower," and other similar items frequent in romantic stories. These terms occur only in works dealing with this story, and every youngster who studies classical Thai literature is required to memorize the list. Everyone is aware of the Javanese origin of the story, and the popular notion is that these special terms are loanwords from Javanese, but Thai scholars who have looked into the matter declare that these words are taken not from Javanese but from the local dialects of Malay spoken in the provinces adjacent to peninsular Thailand.

These terms are seldom so prominent as to impede comprehension. Their occasional occurrence must have served the function of reminding the readers or listeners that this is the Inăw story, not the Rama story or any other of the various standard classics. Here again, as in the case of the royal terms and monks' terms, the obviously correct lexicographical treatment is simply to say "conventional synonym in the Inăw story for—."

In seeking other sets of conventionally substitutable synonyms similar to those described above, one is tempted to identify in traditional Thai poetry another class of special vocabulary in the various sets of highly conventionalized synonyms upon which the classical

[3] A definitive study of Thai versions of this Javanese tale is found in Prince Dhani Nivat, "Siamese Versions of the Panji Romance," *India Antiqua, a volume of Oriental studies presented by his friends and pupils to Jean Philippe Vogel . . .* (Leyden, 1947), pp. 95-101.

poets drew. Many of the major poetic classics were composed to be sung as accompaniment to the ballet. Simplicity was desired in order not to distract attention from the dance and the music. Originality was valued only as it contributed to a more elegant treatment of what was conventionally expected. Poets had for such common meanings as "king," "lady," "army," "horse," "elephant," etc., whole sets of conventional synonyms to draw upon, and in most cases the choice clearly dependent upon nothing more than rhyme and meter. It seems clear that many of these conventional poetic terms are to be handled by the lexicographer in a way parallel to the treatment proposed above for the royal terms, monks' terms, and Malay terms in the Inăw story, that is, to gloss them by saying simply "conventional synonym in classical poetry for—." Even in cases where the earlier history of the word shows that it once had a somewhat different meaning, membership in one of these stereotyped sets of mutually substitutable synonyms seems to erase the semantic subtleties.

But although it seems clear that many terms in the poetic vocabulary are to be regarded in this way, they present a difficult problem in that it is frequently not easy to draw the line between sets of stereotyped synonyms on the one hand and on the other hand sets of near synonyms which cannot be said flatly to be mechanically interchangeable. Although many poets seem to have made their choices on arbitrary metrical grounds, undoubtedly the better poets were aware of and utilized connotational or associative values in choosing among available synonyms or near-synonyms. Further study of the poetic vocabulary may make it possible to decide whether some among these terms are to be regarded as conventional synonyms, parallel to the conventional sets of substitutes described above.

Turning finally to ordinary speech, we find another set of items somewhat similar to the above sets in this feature of conventional substitutability. Virtually all students of Thai speak of "pronouns." It is by no means clear, however, that Thai has a syntactic class of pronouns that can be identified on more objective grounds than the fact that they translate the pronouns of western languages; certainly the published studies that speak of pronouns have not demonstrated such a class.

But leaving syntax aside and approaching the so-called pronouns from a lexical point of view, one is at once struck by the similarity to the above sets in the feature of conventional substitutability. The

pronouns often go in pairs; that is, choice of a particular form for "I" determines the choice of another form for "you," and sometimes the final sentence particle is involved as well. It has often been pointed out that the large range of choices indicating relative status of the speaker and the person spoken to reflects the stratification of social classes in the traditional social scheme.

The pronouns and associated final particles differ from the special vocabularies described above in that with the pronouns it is hardly possible to declare particular forms basic and then say that the others are conventional substitutes. The scope of this paper hardly permits us to deal properly with Thai pronouns, but it seems clear that they share somehow with the special vocabularies a feature of mechanical interchangeability.

It is perhaps no accident, in view of the many areas of the traditional vocabulary in which we find this feature of one-to-one interchangeability, that nowadays when new terms are coined to translate western technical terms each coinage is regarded as a conventional and arbitrary substitute for the western term on which it was modeled.

What does all this mean for the lexicographer? For practical dictionary-making purposes it means that in Thai, and perhaps in many other languages in parts of South and Southeast Asia where society and culture were formerly highly conventionalized, there are certain areas of the lexicon where the dictionary can and should take drastic short-cuts, merely indicating that the item belongs to a particular special set and in that set is a conventional substitute for a given item in the ordinary vocabulary. It is clearly an error to attempt, as all existing dictionaries do, to list again under the special terms all the meanings of the ordinary term for which it is substituted.

And on the theoretical level, it may be that in Thai and other languages of the area we have here a feature of lexical and semantic structure of a simple sort that should be dealt with first in our search for structure on these levels.

A FILE FOR A TECHNICAL DICTIONARY

H. A. GLEASON, JR.
Hartford Seminary Foundation

In recent years the terminology of linguistics has grown rapidly and chaotically. It has become a major problem to everyone in the field from the beginning student to the seasoned professional. A popular way to meet this problem, common to all disciplines, has been the preparation of special dictionaries of technical terminology. About four years ago, I started on a dictionary of linguistics. There are certain features of my procedure which may be of interest. I hope that my experiences may contribute in some small way to the discussion of the technique of lexicography.

Such a lexicon is an ideal small scale experiment in dictionary making. It is "unabridged" in its depth of coverage in that I plan to include all the generally used terminology in its field. Yet it is small. Some parts of the labor of dictionary preparation are proportional to the square of the size. Anything much larger than this proposal would be beyond the capacity of one man. Sometimes I wonder if this limited project isn't too much!

Specialized dictionaries must justify their existence. That is not always as easy as it may seem. The great unabridged dictionaries commonly give as full or fuller coverage. By the time mine is out, a third edition of Webster's New International will have appeared. The present one, published in 1934, and of course compiled a bit earlier, dates from before Bloomfield's *Language*. It is not very useful for the technical terminology of linguistics, but we should not forget that in 1934 it was excellent. The new one will, for a few years, be as up-to-date as a dictionary can be. The defining will have been done with care on the basis of a really phenomenal collection of evidence. It will have been edited by highly competent career lexicographers. I cannot hope to produce anything that will be better done, hardly anything more complete, but only to produce something different. The venture will be worthwhile only to the extent that I can profitably exploit the special opportunities of a specialized dictionary.

I have a more specific public in mind. This gives a certain flex-

ibility in design that is not permitted to a general dictionary. I am not bound to any appearance of consistency of form between linguistic entries, chemical entries, art entries, and ordinary every-day basic words. Not, of course, that the unabridged dictionary imposes any dead uniformity, but the range of variation in form of definition is limited. I will be defining only one type of term, and will have liberty to determine what is the best form for that type without reference to any other. There can be finer meaning discriminations. My tentative definition of *accent* has nine meanings distinguished. Webster's 1934 also has nine, but only five of them are pertinent to language. There is opportunity for tighter tying together of entries and subentries. One particular meaning of *prosodic* can be tied in with a specific meaning of *phonematic.* At best this would be cumbersome in a general dictionary. There can be more entries for phrases, items like *secondary articulation, to mix levels, item, and arrangement.*

Perhaps the greatest difference is that the scope is totally different, not merely smaller. Webster's New International is a dictionary of the English language. It includes linguistics terms only as they are part of the English vocabulary. Mine will be a dictionary of linguistic terminology. This is not really English at all, but an international vocabulary manifested sometimes in English, sometimes in French, or in various other languages. *Phoneme* and *phonème* are not two words, but two spellings of one word contextually determined. One occurs after *the;* the other after *le.* As far as linguistic terminology is concerned we are compound bilinguals. I am accordingly not restricting my gathering to material in English. I do not yet have as strong representation of French usages as of English, but that is largely because I have had the assistance of typists who know only English. The imbalance must be remedied, not simply to have adequate representation of French but of certain authors or schools who write mostly in French. The language difference is incidental.

The definitions will be written, not for the intelligent general public, but for linguists. I shall attempt to give them the information that they will want. I leave it to Webster's to serve the general public.

Basically, the compilation of a dictionary involves little more than the selection of the proper entries and the writing of their definitions. But neither can be done without copious information about

the possible entries. Defining then comes relatively late in the process. The first major operation is the building of a file of citations of usages. In the case of a literary language—and I am dealing with the language of linguistic publications—this consists of material excerpted from the literature. To gather such a file is an extremely long and expensive process. Hence it is one that needs a great deal of advance planning, effective control, and periodic assessment.

Once a lexicographer has a file well started, his die is cast. Knowing this, he starts by laying careful and detailed plans. He does a great deal of estimation and no little experimentation. (I wrote out several hundred slips in each of several formats before I settled on one and scrapped the rest.) The dictionary planner tries to foresee every possible contingency. Every eventuality he fails to provide for will rise up and plague him later.

His planning must be based on some fairly clear idea of the kind of dictionary wanted, its probable size, and the general characteristics of the material to be covered. Otherwise it will be impossible to estimate how much material will be needed, of what kind, and in what form it can best be handled. Before I began, I compiled a list of ten distinct types of terms that I thought should be included. I have had to make only small additions since, and those mostly very early in the work. In excerpting one must follow the rule: when in doubt, take it. It is expensive to take very many citations that might be foreseen to be useless, but it is disastrous to skip over items that will prove to be needed. A reasonably precise definition of scope from the beginning will produce a very much more effective collection of materials.

Planning centers around two problems, efficient excerpting, filing, and later handling of the material, and adequate but not wasteful sampliing of the universe. The first one is a matter of physical forms, efficient procedures, and close calculation of costs in time and money. The physicial form of a file is the least flexible thing about the work. But it also has a tremendous effect on every operation. Have you ever noticed the difference in sorting a pile of 4 x 6s and a pile of 3 x 5s? The first takes a larger table and longer reach. It is slower and more tiring. The larger paper size means higher costs, more space. On the other hand, slips must be large enough to contain the citations to be taken. They must have space for recording their subsequent handling. Perhaps the larger size will be worth the extra cost in time and materials. I so judged and I now think

I was right. But for a different sort of dictionary, I might use a smaller size.

It is the matter of time that needs the closest attention. One second per slip in the size file I contemplate amounts to nearly two full working days—no small matter. A few seconds in marking, in typing, in checking, in sorting, in filing, in reading, or any of the many processes each slip must go through means a great deal in the long run. These savings can be realized only by careful planning based on experimentation.

The second basic problem in building a file is one of sampling. What is wanted is a collection of material which represents with some reliability the universe to be described. It must tell when a term is in general use, and what the meaning or meanings are. To do this the sample must be drawn from every part of the literature to be covered—different subject matters, different terminological traditions, different theoretic positions, different dates, different types of writing. It must give some extra prominence to work that has been highly influential, but it must not neglect the writings of the relatively unknown authors. These will be most effective in indicating how the innovations of the leaders have been accepted.

The sample must be large enough that any term in sufficiently wide use to qualify will show up from three or four authors. Common terms must be represented fully enough that the range of meanings and usages will be clear. The whole file should be planned to get this result with the minimum total material.

Items are excerpted with a context. This should preferably be just adequate to provide the desired information. If insufficient context is given, it will be extremely expensive to refer back to sources. If excessive context is taken, this increases both the costs of excerpting and the time required in reading the slips when defining. Careful planning and good judgement are required here.

The second requisite for good filing is effective control. Information must be available to show how the planned sampling is progressing at any time. This means careful records of what material has been read and how many slips have been written.

I have done this by preparing record slips for each book or paper. These are made in quadruplicate. One is filed under the author. This is the easiest place to check against duplication. The second is filed by the periodical and volume. The third is under the

language group. The fourth is under the branch of linguistics. I can, for example, find out rather quickly how many slips have been taken from the writings of any given linguist. Or, I can find that 1587 slips have been taken from BSOAS, and 959 from TPS. Together with some other items these indicate a fairly adequate representation of recent British work. Or, 811 slips from papers devoted to Romance languages indicates fairly good coverage (there is, of course, a great deal more Romance material covered in general books), whereas 115 slips for Greek and Latin points out a weak spot that needs strengthening.

Some lacunae are large and serious. But I have the information by which I can find them and plan to fill them. Without this control, the sampling could only be erratic and often very inadequate.

At rather long intervals during the course of the work it is desirable to go through the records and to examine a fairly large sample of the file to assess the progress of the collection. May I give you some idea of what can now be found?

The file now contains about 29,000 slips. These represent about 7,000 terms. That works out to an average of four citation slips per word, but, of course, such an average is very nearly meaningless. Seven tenths of the words are represented by less than the average number of slips, indeed nearly half, by only one. Many of these latter will ultimately be omitted. Some will not be found to be in general use; a possible example is *back mediodorsal.* Some terms are questionably technical, as *imbalance* found in a context where it was not clear whether the author intended it as a specifically linguistic term or not. Some are proposed for specific features in some particular language, and will not qualify unless they are found to be commonly chosen for similar features in other languages; a possible example is *leap-frog concord.* Some, though well known in neighboring disciplines are probably not firmly established within linguistics, as *negentropy.* Some, of course, are simple errors. All such things must be excerpted and filed so that they can be fairly judged. Support from several sources will indicate inclusion; the present unique exemplification suggests exclusion.

Examination of such a tabulation and of the items involved makes it possible to arrive at a more accurate prediction of the ultimate size of the vocabulary. The indications now are for something like 3,500 to 4,000 main entries. That is higher than my original estimate of 3,000 terms. It suggests a revision upward of all the original calcula-

tions. They projected a final file of about 50,000 slips.

Two other developments, however, revise the estimate downward. One of these new developments has been the appearance of the CIPL glossaries. Those of Vachek and de Felice will very appreciably cut the amount of excerpting required in the literature of the Prague and Neolinguist schools. Hamp's *A Glossary of American Technical Linguistic Usage* came too late to save as much. Many of the works he examined had already been excerpted. But his excerpting gave a very significant check on my own.

The second is that I seem to have attained to a higher efficiency in excerpting than I had figured on. Obviously, in any process like this, many of the citations taken are going to prove useless. Some represent items that will finally be excluded. Others are redundant. The real measure of a file is not the total number of citations, but the number that actually contribute some useful information. Recent examination of a fairly large sample suggested that about 15 percent of the slips are redundant and about another 15 percent represent words that will be excluded. That means an over-all efficiency of 70 percent. If that can be maintained, a total of 40,000 slips will be better than the 50,000 with 50% useful on which the original plan was based.

Of course, as the file grows, so do the opportunities for citations to be redundant. More excerpting on the same basis will inevitably depress the efficiency of the sampling. It must be more carefully planned and controlled. But if this care can save writing a few thousand slips, it may well be worth it. I now have hope that 40,000 to 45,000 slips will adequately support the lexicon that I have in mind. Further excerpting will be done on a new and tighter plan that will be designed to fill the present deficiencies with 10,000 more slips. If I can do that, it will represent a tremendous over-all saving in labor, expense, and elapsed time. A later assessment will tell if I have been successful.

Or we can look at the problem from another direction. On the basis of a probable vocabulary of 3,500 entries, how adequate is the present file? Certainly some entries are sufficiently well documented to give no difficulty at all. For these further excerpting should be rather strictly limited. There is always the possibility of finding additional meanings, or more support for poorly represented meanings, even in the most heavily documented entries. It is therefore not possible simply to set up a list of words that will be hereafter off

limits. But for these items, it will be desirable to exercise extra care in excerpting.

On the other hand, about 1000 of the expected 3500 entries are as yet inadequately covered. To a certain extent, I can supply the deficiency from my own knowledge of the terminology, but I would hesitate to rely heavily on this for anything approaching 30 percent of the total vocabulary. Further filing must be concentrated on obtaining fuller documentation for these items. Familiarity with the present file can be of great value in accomplishing this. The actual writing of definitions, still in an experimental stage, can sharpen up a feeling for what is needed. Accordingly, from time to time I write a few definitions. Several hundred have been written so far. These serve two important functions. First they help me appraise the present collection of material. Secondly, they constitute the necessary experimentation on which planning of the later work will be based.

This preliminary drafting affords another significant set of statistics. I expect about two-thirds of the entries to have only a simple definition apiece. Another sixth will have two. The most complicated that I have written so far has nine, one of them subdivided into three. This range of complexity must be taken account of in any planning. Present experience shows an average of 1.7 definitions per entry. That means a total of 6,000 to 7,000 definitions. It is really this, rather than 3,500 entries that is significant in calculating needed support. A bit of arithmetic will show that 40,000 slips will be adequate only if I can succeed in maintaining a fairly high efficiency and good distribution.

All of these considerations enable me to guide my reading and filing. Lacunae of various sorts come to attention, and a basis is provided for planning to fill them. Excerpting is a haphazard process at best; without careful control it can become extremely unproductive.

I do not want to hold my own procedures up as a model. I am sure that they can be improved in many ways. But I do want to emphasize my conviction that a good dictionary file requires careful planning, effective control, and periodic searching assessment. I started my present project with a minimum of past experience. Planning had to deal with a great number of imponderables. If I were starting another dictionary, many of the things that then required a great deal of guess work would be known in advance. I could cer-

tainly by-pass a number of the more complex problems. But my experience would lead me not to less planning but to more. I would establish even more careful controls. I think I could thus produce a better file for less work. Perhaps the improvements, percentage wise, would look small. But a dictionary is a huge undertaking. Small savings are multiplied by very large factors. A dictionary file is no place to leave the outcome to chance.

APPENDICES

Appendix I

PROGRAM OF THE TWELFTH ANNUAL
ROUND TABLE MEETING

REGISTRATION—Lobby of the Walsh Building, from 8:30 a.m., April 21.

FIRST SESSION—Friday, April 21, 9:30 a.m.

WELCOMING REMARKS:

Reverend Frank L. Fadner, S.J., *Regent, Edmund A. Walsh School of Foreign Service*

Robert Lado, *Director, Institute of Languages and Linguistics*

Léon E. Dostert, *Director, Machine Translation Research and Special Projects*

Michael Zarechnak, *Chairman, Twelfth Annual Round Table Meeting*

Elisabeth D. Woodworth, *Co-Chairman, Twelfth Annual Round Table Meeting*

PANEL I: General Semantics

Chairman: Samuel Hayakawa (San Francisco State College)

Val Hempel (Army Language School, Monterey, Cal.)
General Semantics and Foreign Language Teaching

Laura Lee (Northwestern University)
Some Semantic Goals for Aphasia Therapy

Harry L. Weinberg (Temple University)
Values of a Negative Metalinguistic System

*M. Kendig (Institute of General Semantics, Lakeville, Conn.)
General Semantics 1961: Historical Perspectives, Trends, Criticisms

LUNCHEON MEETING—Friday, April 21, 1:15 p.m.
Palms Lounge, Walsh Building

Speaker: Fred Householder (Indiana University)
***The Institutionalized Tertiary Response*

SECOND SESSION—Friday, April 21, 3:00 p.m.

PANEL II: Psycholingusitics

Chairman: John Carroll (Harvard University)
An Application of Psycholinguistics in Language Teaching

Paul Pimsleur (University of California)
A Study of Foreign Language Learning Ability

Wallace Lambert (McGill University)
Behavioral Evidence for Contrasting Forms of Bilingualism

Norman N. Markel (The University of Buffalo)
The Connotative Meaning of Several Initial Consonant Clusters in English

RECEPTION—Friday, April 21, 6:15 p.m.
Reception given by Georgetown University,
The Palms Lounge, Walsh Building.

THIRD SESSION—Saturday, April 22, 10:00 a.m.

PANEL III: Lexicography

Chairman: Hans Kurath (University of Michigan)
The Semantic Patterning of Words

Philip B. Gove (G.&C. Merriam Company)
Subject Orientation within the Definition

William J. Gedney (University of Michigan)
Special Vocabularies in Thai

H. A. Gleason (Hartford Seminary Foundation)
A File For a Technical Dictionary

CLOSING LUNCHEON—Saturday, April 22, 1:30 p.m.
Dupont Plaza Hotel

Speaker: Samuel Hayakawa (San Francisco State College)
***Psychiatric Concepts and International Communication*

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*Miss Kendig's talk was omitted from this Monograph because she did not supply the editor with a written paper before this volume went to press.

**Both luncheon talks have been omitted from this volume with the knowledge and consent of the speakers.

Appendix II

MEMBERSHIP OF THE TWELFTH ANNUAL ROUND TABLE MEETING*

Abernathy, Juanita N.	Savannah, Georgia Bd. of Public Ed.
Akers, W. G.	Norfolk, Virginia
Alatis, James E.	U.S. Office of Education
Allee, John G.	George Washington University
Allen, Rolfe L.	U.S. Army Department
Aloyse, Sister Teresa, S.P.	Immaculata Junior College
Ani, Moukhtar	Georgetown University
Ansell, Ann Tracy	Washington, D. C.
Balint, Audras	Columbia University
Baskoff, Florence	New York University
Berkmaier, Emma	University of Minnesota
Binda, Jeffrey H.	American University
Binda, Margaret C.	Foreign Service Institute
Bishai, Wilson B.	Johns Hopkins University
Blatchford, Charles H.	Institute of Languages and Linguistics
Bodman, Nicholas C.	Foreign Service Institute
Boothe, Robert O.	California State Polytechnic College
Bostain, Mary	National Science Foundation
Brewington, Arthur W.	State Teachers College at Towson
Brower, Helen B.	Georgetown University
Brown, A. F.	University of Pennsylvania
Buenaventura, Amparo S.	Georgetown University
Burkhart, Edward I.	American University
Burton, Robert A.	New York, New York
Carroll, John	Harvard University
Carroll, John H.	George Washington University

* Not all those who attended the Twelfth Annual Round Table meeting signed the register. Consequently ,the above list is not complete.

Carter, Marion Elizabeth	D. C. Teacher's College
Carton, Aaron Süss	N. Y .University School of Education
Chafe, Wallace L.	Smithsonian Institute
Cheek, John H., Jr.	Vanderbilt University
Chennault, Claire L.	Washington, D. C.
Cherel, Lucien G.	Lacaze Academy of Languages
Choseed, Bernard	Institute of Languages and Linguistics
Chung, Kyung Cho Chung	U.S. Army Language School
Clark, Richard C.	University of Pennsylvania
Convers, Gilbert	American Council for Nat'l Service
Cook, Ritter S.	Fairfax County School Board
Cooper, Paul V.	American University
Cornelius, Edwin T.	English Languages Services, Inc.
Cowell, Mark W.	Georgetown Arabic Research Program
Dallaire, Raymonde	MIT
Damdoint, Gilbert B.	Washington, D. C.
Davis, Marion Shaw Davis	National Cathedral School
Dinbergs, Mrs. A.	Immaculata Jr. College
Dindorf, Rev. Meinrad, O.S.B.	Saint John's Abbey
Dixon, John	Washington, D. C.
Donovan, James, Jr.	Department of State
Dorr, Anne L.	Stanford University
Dostert, Léon	Machine Translation Research
Drake, James A.	Avon Lake Public Schools
Eastman, Rev. Addison J.	National Council of Churches
Eaton, Esther M.	U.S. Office of Education
Eggers, Keith K.	U.S. Office of Education
Erwin, Wallace	Georgetown University
Fabry-Garczynska, Zofia	University of Warsaw
Fadner, Rev. Frank L., S.J.	Georgetown University
Faust, George P.	U.S. Office of Education

Ferguson, Charles A.	Center for Applied Linguistics
Fleming, Jeanne	Georgetown University
Fouré de Suge, Jacqueline	Winsor School
Francis, W. M.	Franklin & Marshall College
Frank, Marcella	New York University
Freeman, Harry	International Cooperation Administration
Friedrich, Paul	University of Pennsylvania
Frith, James R.	Foreign Service Instutite
Fuller, Helene R.	New York, New York
Gedney, William J.	University of Michigan
Gibbs, John W.	Vox Institute of Languages
Glaude, Paul M.	New York State Education Dept.
Gleason, H. A.	Hartford Seminary Foundation
Glenn, Edmund S.	Washington, D. C.
Glenn, Thomas L.	Riverdale, Maryland
Goodwyn, Frank	University of Maryland
Gove, Philip B.	G. & C. Merriam Company
Grant, Alice W.	Howard University
Griffith, Mrs. A. C.	Plainview High School
Hall, Edward T.	Washington School of Psychiatry
Hall, Wendell H.	Weber College
Harms, L. S.	Louisiana State University
Harrell, R. S.	Georgetown University
Harris, David P.	American University Language Center
Hatzfeld, Helmut A.	Washington, D. C.
Hayakawa, Samuel	San Francisco State College
Hayden, Robert G.	Language Resources Project
Hayes, Mary E.	U.S. Office of Education
Headley, Robert K.	U.S. Department of Defense
Kurath, Hans	University of Michigan
Lado, Robert	Institute of Languages and Linguistics

Lambert, Wallace	McGill University
Lanham, L. D.	Carnegie Corporation
Laurentana, Sister M., CSFN	Holy Family College
Lee, Laura	Northwestern University
Lee, Ralph	Washington, D. C.
Leerawantana, Meewan	Institute of Languages and Linguistics
Lewis, Kathy	Rockville, Maryland
Linn, Irving	New York, New York
Lizotti, Jeanne	Queens College
Lloyd, Paul M.	Foreign Service Institute
Long, Richard A.	Morgan State College
Madurga, Raymond	Seido Language Institute
Markel, Norman M.	University of Buffalo
Martinez, Manuel G.	School of Foreign Service
McAuliffe, John J.	American University Language Center
Mendeloff, Henry	University of Maryland
Miele, Alfonso R.	U.S. Air Force Academy
Miller, David C.	Washington, D. C.
Morgan, Raleigh, Jr.	Center for Applied Linguistics
Moyne, John A.	Machine Translation Research
Mueller, Herta	Institute of Languages and Linguistics
Mueller, Hugo	American University
Mueller, Klaus A.	Beloit College
Nolan, Dallas	National Cathedral School
Norton, Lynne L.	U.S. Office of Education
Norton, Mrs. Paul	Koinonia Literacy Center
Nyabongo, Virginia S.	Tenn. Agri. & Indus. State University
Ohannessian, Sirarpi	Center for Applied Linguistics
Orlov, Paul F.	Georgetown University
O'Rourke, Everett V.	Calif. State Department of Education
Orstein, Jacob	U.S. Department of Agriculture

Panuzio, Wesley C.	Par College ELT
Pavia, Mario	Georgetown University
Pimsleur, Paul	University of California
Pipa, Arshi	Long Island City, New York
Poltoratzky, Marianna	Georgetown University
Poston, Lawrence, Jr.	U.S. Office of Education
Priceman, Mark	IBM World Trade Corporation
Rameh, Clea	Sao Paulo, Brazil
Remer, Ilo	U.S. Office of Education
Rivers, Dorothy	Jamesville-DeWitt Central School
Robbins, Warren M.	Department of State
Robertson, Jean C.	American Language Center
Rocca, Marcel X.	Institute of Modern Languages, Inc.
Rojas, Pauline	Cranford, New Jersey
Rogoyski, Doman	Library of Congress
Rokitiansky, Nicholas	HEW
Rovner, Philip	University of Maryland
Ruhwan, Marjorie	Washington, D. C.
Sa'id, Majed	Princeton University
Saint-Pierre, Gaston	Collège Militaire Royal de Saint-Jean
Schleifer, Ben	Central High School
Schmidt, Ludwig Erick	Universität Marburg
Schork, R. J.	Georgetown University
Shamblin, William A.	U.S. Office of Education
Seymour, P.	Georgetown University
Shapiro, Ilse	Georgetown University
Shears, Helen H.	Washington, D. C.
Sherman, Mrs. John F.	Kensington, Maryland
Sherman, John F.	Kensington, Maryland
Shiro, Eugene L.	American University Language Center
Sonkin, Robert	The City College

Stahlman, M. Lucille	American University Language Center
Stilo, Donald L.	Georgetown University
Stowasser, Karl	Georgetown University
Stuart, Don Graham	Linguistic Survey of Asia
Suse, Ruth E.	American University
Swift, Lloyd B.	Foreign Service Institute
Swope, J. Morgan	Dept. for U.S. Exchange Relations
Thérèse, Sister Margaret, S.N.D.	Trinity College
Thomas, P.	Washington, D. C.
Thompson, Ruth	Koinonia Foundation
Tontarshi, Richard E.	American University
Trager, Edith Crowell	Washington School of Psychiatry
Turner, Richard P.	Avon Lake High School
Urdang, Lawrence	Random House, Inc.
Viljuv, V.	American University
Waggoner, Dorothy	U.S. Office of Education
Watkins, Mark Hannah	Howard University
Waurzyniah, Loretta A.	U.S. Office of Education
Weinberg, Harry	Temple University
Weiss, Bernard	Detroit Public Schools
Werbos, Stanley N.	University of Texas
Whale, Margaret	Georgetown University
Wilhelm, Maria	U.S. Naval Intelligence School
Winburne, John N.	Michigan State University
Winston, Etlina Beulah	Howard University
Wolski, Edward D.	Library of Congress
Woodworth, Elisabeth D.	Georgetown University
Wright, Elizabeth	George Washington University
Wu, Amy	U.S. Office of Education
Yakobson, Helen	George Washington University
Zarechnak, Galina	Washington, D. C.
Zarechnak, Michael	Georgetown University

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